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A BILL BROTHERS PUBLICATION

INDIA RUBBER WORLD

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Mill Room of the Future

Andrew Hale[1] and Carl F. Schnuck[1]

THE two previous articles in this series have dealt, respectively, with the production of rubber pellets[2] and the automatic weighing and handling of materials.[3] These embraced the principle of the free flow of materials, and it is on that principle that this *prophecy* of the *Mill Room of the Future* is based in this third and concluding article. This outline of the future mill room is imaginary only to the extent that such a mill room does not yet actually exist in entirety. But the individual production units do exist and are in use in the rubber and other industries so that it remains only to complete the development of some of these units for rubber mill room service and to gather all into one complete rubber processing plant. It is recognized that the application of automatic weighing and conveying equipment to the handling of rubber and its compounding ingredients involves certain engineering and mechanical problems which are perhaps more complex and difficult of solution than they have been in connection with the processing of other materials. These problems, however, are not beyond the ingenuity of the engineers and technicians of the rubber industry and the machinery and equipment suppliers, and with a continuation of past progress, future developments should soon bring the *Mill Room of the Future* to complete realization.

Free-Flowing Materials

To facilitate an understanding of the advantages to be derived from the application of the principle of free-flowing materials to the preparation and processing of rubber, let us first imagine a compounded rubber stock as a solution composed of various liquids. The machinery necessary for storing, conveying, and mixing would hardly be recognizable as rubber mill room equipment. Raw materials would be stored in tanks, and if these various liquids were unstable and of varying qualitative analysis, the tanks would be equipped with stirring mechanisms for blending the various liquids, which would then be drawn from their respective tanks through flow meters to proceed via pipe to the mixing vat, where they would be stirred and discharged in a stream. The stream would flow into a final mixed-solution reservoir, and its contents, in turn, would flow continuously to a subsequent process. Certainly no industrialist, cognizant of the advantages of continuous flow of materials in manufacturing processes, would contemplate storing various solutions in small containers taking up acres of floor space, nor would he countenance the weighing of these solutions by hand or dipper into batch pans to be carefully carried to the mixing vat. Finally, he would not store the final mixed solutions in small cans, which would also occupy valuable floor space.

To summarize, none of the product, either in its raw state or finished form, would be seen or touched by hand, and such a mill room would be an array of tanks, pipes, weigh meters, and processing equipment.

In addition to this, both the supply and finished storage tanks would be equipped with gages so that the inventory situation would be known at all times. The operator could always tell how much of each material was on hand, and he could see at a glance what the production schedule should be by observing the quantities in the various storage tanks.

Like liquid solutions, other materials having free-flowing properties can also be transported, stored, perpetually inventoried, and regulated, with no manual labor. Carbon black and many pigments used in rubber processing are already obtainable in free-flowing form, and those that are not free-flowing can be assisted in many mechanical ways. Recent developments[2] in the production of pellets of crude rubber, reclaim, and master batches remove the most serious obstacles to the *Mill Room of the Future* based on the handling and processing of free-flowing materials. Such a mill room is pictured in the accompanying flow chart and described in the text which follows. Also mentioned in the text are possible variations from the equipment and methods shown by the chart.

[1] Farrel-Birmingham Co., Inc., Ansonia, Conn.
[2] "Pellet Rubber", INDIA RUBBER WORLD, June 1, 1941, pp. 35-38.
[3] "Progress in Compound-Room Practices", *Ibid.*, July 1, 1941, pp. 29-33.

Receiving and Storage

Crude rubber bales formerly were shipped in veneer cases, which presented a troublesome removal problem. Now bales are enclosed in burlap fastened with steel tape. These bales can be squeezed between two platens to break the tapes, and the covering can be blown off by compressed air while the bales are still on the conveyer. To avoid the trouble caused by embedding of the narrow steel tapes in the bales, which sometimes occurs, the tapes could be made wider and thinner, or possibly of some other material than steel. Passage through a hot caustic bath and wash will remove shreds of jute clinging to the bale, or rapid passage through a short oven will burn fine vegetable fibers, there being a safe temperature differential between burning of fiber and fusing of rubber in a short exposure. Eventually, the bales might be hermetically sealed at the plantations by dipping into a skin-hardening solution or wrapping in tough resin-coated paper which can be burned off or blown clear in a continuous furnace. The bales could be supported on points during this operation to avoid the need of turning over.

The practice of wrapping bales in rubber sheets, which has been initiated by some plantations, may be developed and come into universal use. Rubber bales in the future might well be made smaller. Quarter-size bales, wrapped in rubber and without steel binding tape, have already been shipped from the plantations and greatly simplify the problem of handling in the rubber factory.

Storage of rubber bales is a problem which has received scant consideration, despite the awkwardness of handling or piling by hand or portable loaders. When the bales have been freed from their shipping container or covering on a continuous conveyer, they could be readily delivered to cross storage conveyers, consisting of vertically disposed belt conveyers supported by idler rollers. The number of storage conveyers would be determined by the grades and the quantity of the inventory, but at the control of the technician, or automatically, bales could be selectively delivered to the first production conveyer without having once been handled by labor. Blending of bales from various shipments is also easily effected.

Bale Reduction

Breaking down of the baled rubber without precutting is possible even though the bales are frozen or hard. The bales are brought from storage by conveyer to a large cracker with special design of corrugations which pull the rubber into the bite with an induced transverse rolling, insuring constant feed without tension. At the same time a milling effect takes place which forms the rubber into a sheet of sufficient regularity to provide full feed to a second cracker. The second cracker also has special corrugations on one roll working against a smooth roll to thoroughly work and heat the rubber while forming it into a sheet. This cracker has steam-heated rolls to obtain the maximum of preheat before plasticating. While mechanical energy converted into heat is not usually economical, it is so in this instance because little of the energy is lost, but is applied directly to the material. The two crackers, of course, are in close tandem for avoidance of heat loss.

[4] The formation of pellets and handling, cooling, storing, and feeding to Banbury mixers is described in "Pellet Rubber", INDIA RUBBER WORLD, June 1, 1941, pp. 35-38.

Rubber Breakdown

From the crackers the warm soft strip of rubber proceeds through a heated, insulated tunnel into the feed hopper of a Gordon plasticator, with no manual assistance. The plasticator is equipped with pelletizing head, and the rubber comes from this machine in pellet form. An increase of production of nearly 15% is obtained over cold feeding by the elevation of temperature of the incoming rubber. Also, owing to the increased internal working of the mass in the pelletizing head, the final softness is sufficiently increased to eliminate the former occasional second pass. The pellets are dusted to prevent adhesion as they emerge from the machine; various agents are used in fractional percentage by weight so as to produce no harmful dilution.[4]

The hot pellets descend through a cooler and, while passing over agitated screens, are subjected first to water sprays and then to air blasts, finally arriving at the suction end of a pneumatic conveyer.

Compound Room

From the pellet cooler the pellets proceed to storage bins so located over the compound room that they can be filled from the floor above and discharged into weigh hoppers below. Reclaimed rubber and master batches in pellet form, as well as crude rubber pellets, are also stored in similar bins. Slowly revolving helicoids in each pellet bin constantly blend the entire mass and maintain free flow. Depending on the size of the bin, many thousands of pounds of rubber pellets are thus intimately blended or "averaged out."

Bins for pigment and carbon black are also located in a similar manner. Typical bins for these ingredients are shown in the flow chart. All bins are equipped with pressure contacts at points along the side to indicate the supply level on the master control board.

The scales located below the bins are fully automatic and can be set at the master control board to discharge a prescribed amount. Their operation is described in the section on the master control board, as is the sequence and time intervals between respective weighing operations. Below the scales is shown the feed belt which receives the rubber pellets and compounding ingredients to convey them directly to the Banbury hopper. Carbon black is automatically weighed and discharged directly into the Banbury hopper. Oils are also automatically weighed and discharged directly into the Banbury, or blown in automatically by pressure.

Reclaimed rubber can be cut from the usual slabs by a shear and fed into a tuber and discharged in large pellet or disk form on to a weighing conveyer and delivered in proper quantity on to the Banbury feed belt as required. Later developments may make it possible to pelletize reclaimed rubber as it leaves the finishing refiner and blow the pellets directly into a box car. At their destination these pellets can then be blown directly into bins, thus eliminating a sizable aggregate handling cost on the part of both supplier and consumer. Wooden skids now carrying unit quantities of slab reclaim would also be eliminated.

After the batch is mixed in the Banbury, which is shown in cross-section, it is discharged into a specially designed Hale pelletizer. The latter replaces the sheeting mill and quickly converts the discharged mass into mixed stock pellets that can be cooled in one-fourth to one-third of the time required to remove the heat from sheets of mixed stock. From the cooler under the pelletizer the

August 1, 1941

Flow Chart

pellets are then conveyed to storage bins. Master-batch pellets are returned to bins in the compound room, and mixed stock pellets proceed to final storage, all with no manual assistance.

Since human variables have been removed, the fluctuations which cause "off-quality" batches are greatly reduced and a low percentage of laboratory rejections can be anticipated. Samples of each batch can be taken by extrusion through a special die in the pellet head and laboratory tests made and results known before the pellets are delivered to final storage.

Final Processing

The bins for storing the final mixed stock are also equipped with pressure contacts to indicate stock level on the master control board. In these bins also, slowly revolving helicoids again blend large quantities of mixed stock, thus multiplying the original blend many times and increasing the uniformity of the final product.

Warming of the stored, mixed stock is accomplished by controlled feed of the pellets to the first of two warming mills. The pellets fall on one end of the rolls of the mill and are formed into a sheet from which a ribbon is taken and deposited at one end of the storage warming mill. In place of the first warming mill the pellets could be delivered to a tubing machine having a delivery head to form a continuous rectangular strip. After the stock is deposited on the storage warming mill, it moves in gradual progression to the other end of the roll face where another continuous strip is removed for supplying the calender or tuber. The strip cutter has one knife, electrically adjusted to control the width of the strip. Thus, when the control mechanism on the calender or tuber, indicates overfeed or underfeed of the stock, the position of the movable knife on the warmer is automatically positioned to provide the proper feed.

Since calendering will be continuous without shutdown, and speed reduced only for joining the fabric, when such is used, the control of gage is fully automatic by gaging of thickness by mechanical means or by the electrical resistance method. On wide-face calenders oscillating strip feeders are served by individual strip cutters on the warmers to control the width of the goods. Experience dictates the size of gum bank to balance the crown of the rolls for each grade of stock.

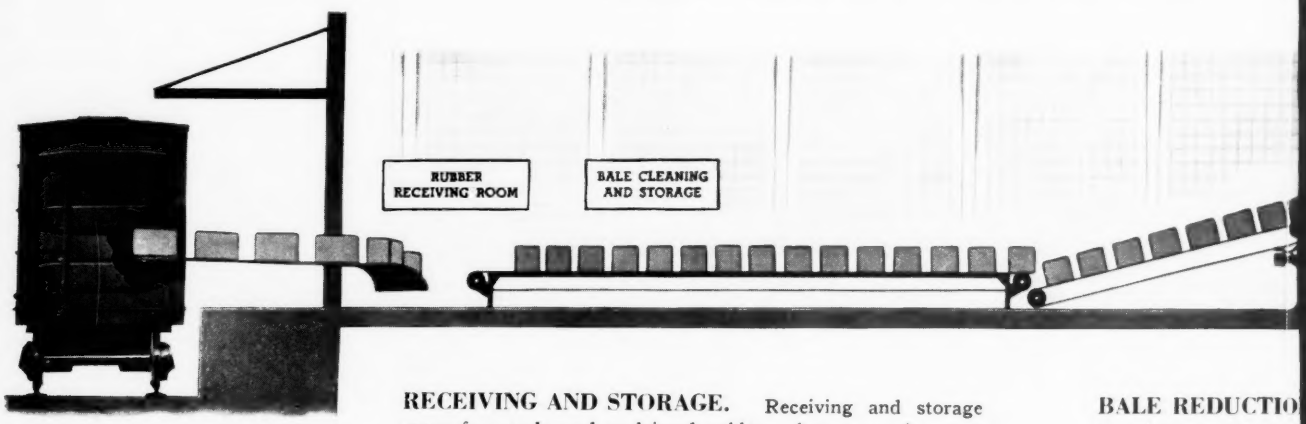
Tubing machine feed is controlled according to the material being run. When volumetric uniformity is desired, a photo-electric cell is affected by piling up of stock on the feed roller hopper, and when weight of extrusion is to be controlled, a relay regulated by the power input to the driving motor varies the width of strip.

Master Control Board

The key to the entire operation of the *Mill Room of the Future* lies in the master control board.

An important function of the master control board is to indicate the inventory or storage levels of all raw ingredients, as well as finished mixed stocks in their reservoirs. Referring to the photograph of the control board (see last page), across the top of the board are located eight vertical rows of lights which show the supply levels of eight different ingredients. These represent the maximum variety of materials required for the Banbury mixer, which this board operates. At the bottom are three vertical rows of lights which represent three different final mixed stocks. When the bins are three-quarters full, or more, all four lights in the vertical rows are lit, but as the level drops the lights are extinguished from top to bottom in succession. There can, of course, be more than four lights in the vertical row, the number depending on how closely the supply level must be indicated. If desired, a calibrated scale could be provided to read the number of pounds of material direct. In the case of the final mixed stock storage bins these levels could be interpreted into units of finished product. Thus, a visible production control, which is simple, positively accurate, and requiring no clerical assistance, is provided. The operator at the master control board establishes the work for the day and needs but know how many units of the various finished stocks must be processed.

Another function of the control board is one of execution. This is extremely simple, involving no more work than dialing a telephone number. The train of events between the manipulation of the control board and the



RECEIVING AND STORAGE. Receiving and storage room for crude and reclaimed rubber where wrappings are removed and bales prepared for processing.

BALE REDUCTIO
two large crackers i
The first cracker re
is further reduced to

actual operations in the compound room involve well-known and tried equipment. For example, if the bin with finished mixed stock "X" demands refilling, the hand-wheel shown at the right of the photograph is turned until "Stock X" appears in the panel opening. With it is shown the formula giving the time sequences at which the various ingredients must be weighed and fed to the Banbury and the number of pounds of each ingredient comprising the formula. Directly above the formula panel are shown the "sequence timers" which make it possible for each ingredient to be weighed and fed to the Banbury in correct order and at the correct time intervals.

Directly below the formula panel are the "weight controls." By rotating the pointer around a dial to the prescribed number of pounds the scales for each ingredient are accurately set for the weighing. Here the well-known Selsyn generator and motor are employed to move the poise along the scale beam by remote control. The motor part of this combination is mounted on the scale and its threaded shaft engages with another which is part of the poise. Rotation of the motor shaft or screw moves the poise laterally along the scale beam. The generator, which is synchronized with the motor, is located at the control board. Turning the pointer around the dial to the number of pounds required rotates the generator the number of times necessary to make the motor move the poise along the scale beam to the number of pounds required.

With the sequence of weighing and feeding the Banbury established, and with scales set for proper weighing, the cycle start button is pressed. Scales weigh and discharge the quotas in proper order on to a common Banbury feed belt. Simultaneously, the Banbury floating weight rises and falls as the ingredients arrive at the hopper. At the end of the cycle the Banbury discharge door opens to discharge the batch and then closes. Closing of the door automatically starts a repetition of the same cycle. Counters can be provided to repeat the weighing and mixing until the required amount of batches have been delivered to the finished mixed stock bins. For simplicity, only a representative set of bins and controls have been shown. Obviously, more than one Banbury and combination of scales can be regulated from the same control board. The principles involved are basic ones and can be modified to suit the largest single-item producer or the smaller variety product manufacturer.

Summary of Advantages

It has been pointed out that free-flowing materials are the keystone of this radically new and different type of mill room. They can be transported, stored and regulated with a minimum of manual labor. That is why this plant of the future has often been referred to as the "One-Man Mill Room."

Production control has been simplified by making visible, perpetual inventories of all raw materials and finished mixed stocks available every minute of the day. These are unquestionably accurate, where present-day stock card systems must frequently be checked against the physical inventory. The master control board operator does the work of the entire production control force by simply observing what is required in the finished stock reservoirs.

Large quantities of crude rubber can be blended before compounding, and this blending is multiplied many times in the finished stock storage bins, thus increasing the uniformity of the finished goods.

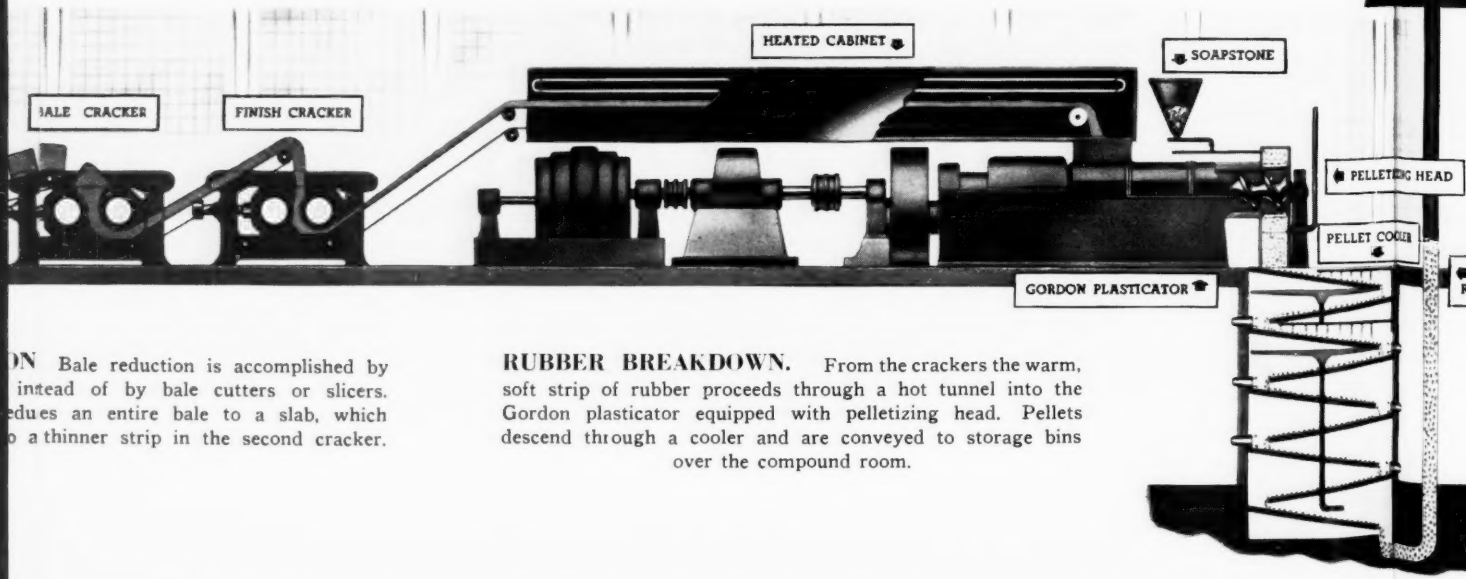
Banbury mixing time is greatly reduced. Actual practice demonstrates that rubber in pellet form has an exposed area many times greater than that of rubber in the form of slabs or lumps. Since the mixing time is reduced, the stock is discharged from the Banbury at a lower temperature.

All curing matter can be added in the Banbury in most cases, first because of the shorter mixing cycle and second because of the shorter time required to convert the mixed stock into cold pellets.

The positive accuracy of automatic weighing and the close control of the amount of ingredients which go into a batch may make it possible to reduce the laboratory inspection and control now required.

Some Additional Future Possibilities

The *Mill Room of the Future* here presented may seem overdrawn, but it is depicted with full realization of the problems of those plants which have hundreds of formulas with which to cope and sometimes very little quantity of each to be mixed. Numerically, the rubber manufacturers in this category far exceed the larger plants

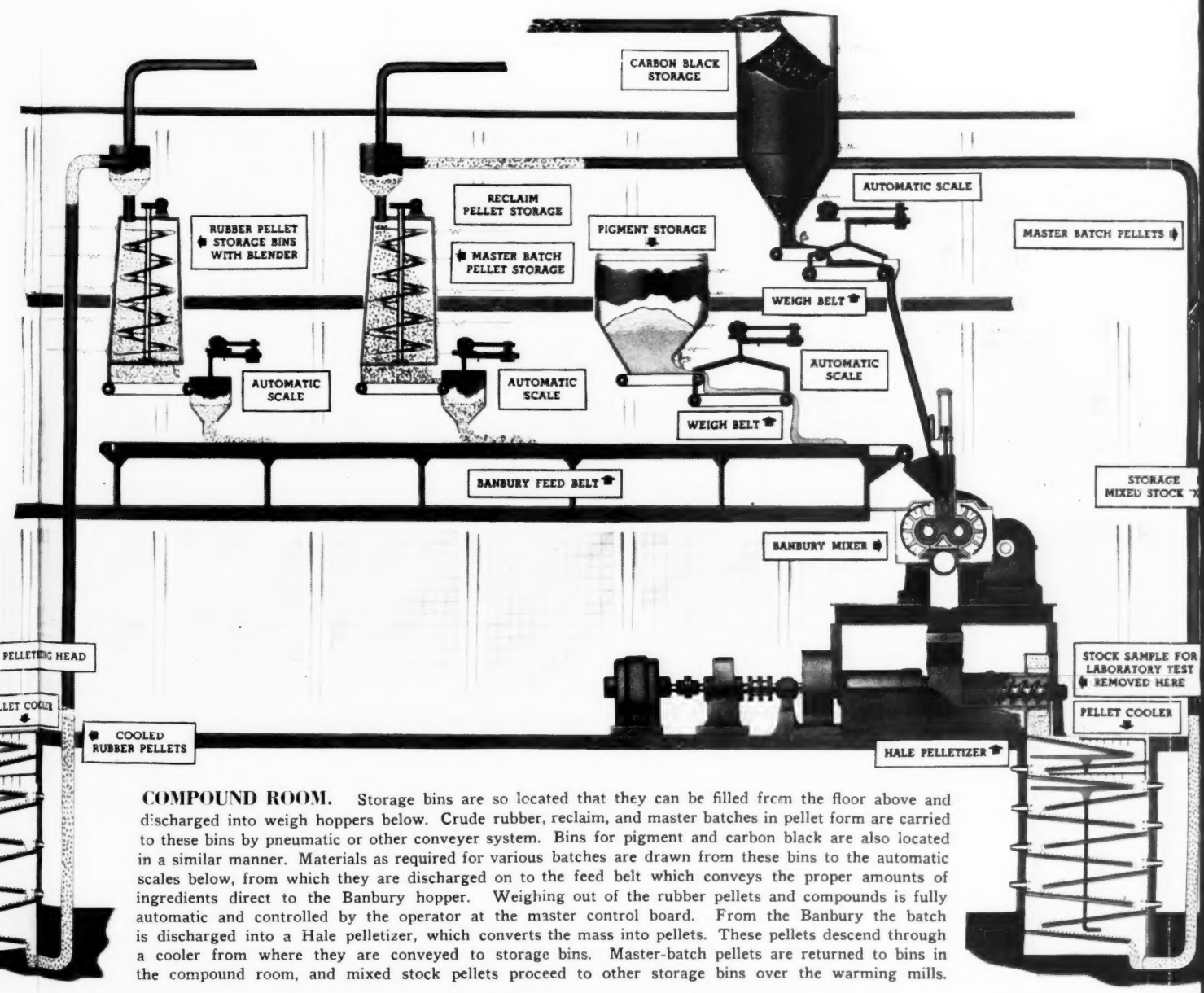


ON Bale reduction is accomplished by instead of by bale cutters or slicers. edues an entire bale to a slab, which o a thinner strip in the second cracker.

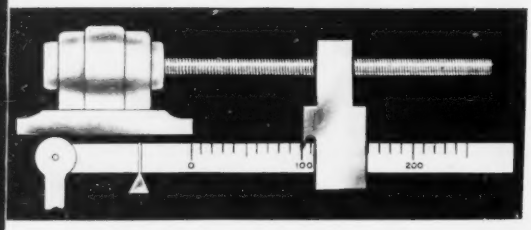
RUBBER BREAKDOWN. From the crackers the warm, soft strip of rubber proceeds through a hot tunnel into the Gordon plasticator equipped with pelletizing head. Pellets descend through a cooler and are conveyed to storage bins over the compound room.

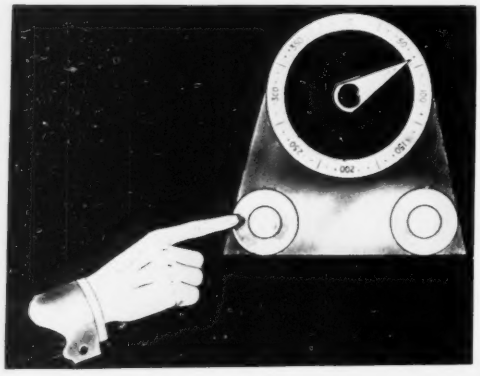
which have a simpler problem. However it is hoped that even disagreement with any of the suggested layout will promote helpful discussion. Certain it is that many plants are handicapped in the early stages of manufacture by poor handling and compounding facilities. It might be of considerable benefit if, cooperatively, or from commercial suppliers, they could purchase quality guaranteed rubber, broken down to specified test, and in the form of pellets. Likewise, various grades of master-batch rubber and black and other commonly used basic formulas in pellet form would simplify final manufacture. Organizations which have widely distributed factories could do much of their preparation work in one central unit with such equipment and control as almost to eliminate manual labor.

Consider the annoyance and extra operations 25 and more years ago when most factories had to wash their rubber on a washer line in the basement, and provide drying facilities, with a large inventory of rubber to be carried as a dead investment, to say nothing of expensive labor and handling. Today a wash line is seldom seen in a manufacturing plant and could be completely dispensed with except for sanitary goods requiring extreme cleanliness. A similar step forward will be taken with the preparation of crude rubber by the plantations into directly usable form. The rubber will be processed on a large scale and shipped in dust-tight cases to be loaded directly into storage bins. The manufacturer is relieved of all costly preparation and can proceed directly with compounding in the Banbury mixer to make up the various formulas required, on a parity with those having volume production. Speed of compounding being balanced against safe working temperatures, even to those highly accelerated gas stocks frequently encountered, and production keeping pace with use to avoid storage and handling, the small rubber mill of the future will also be handled by a technician with only slight assistance on the floor for direction of stock to the calender or tuber.

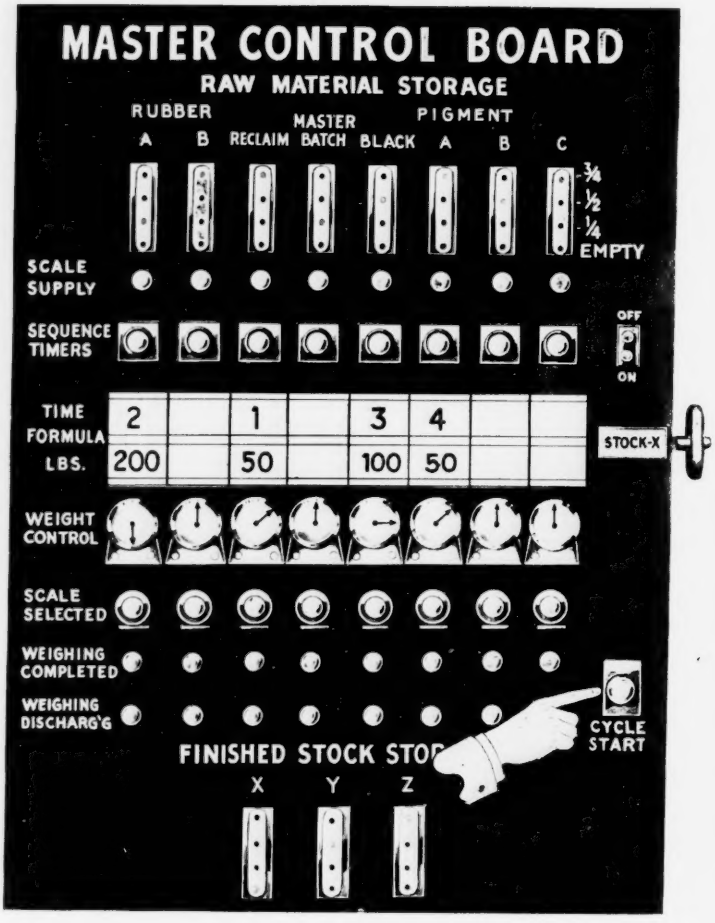


COMPOUND ROOM. Storage bins are so located that they can be filled from the floor above and discharged into weigh hoppers below. Crude rubber, reclaim, and master batches in pellet form are carried to these bins by pneumatic or other conveyer system. Bins for pigment and carbon black are also located in a similar manner. Materials as required for various batches are drawn from these bins to the automatic scales below, from which they are discharged on to the feed belt which conveys the proper amounts of ingredients direct to the Banbury hopper. Weighing out of the rubber pellets and compounds is fully automatic and controlled by the operator at the master control board. From the Banbury the batch is discharged into a Hale pelletizer, which converts the mass into pellets. These pellets descend through a cooler from where they are conveyed to storage bins. Master-batch pellets are returned to bins in the compound room, and mixed stock pellets proceed to other storage bins over the warming mills.

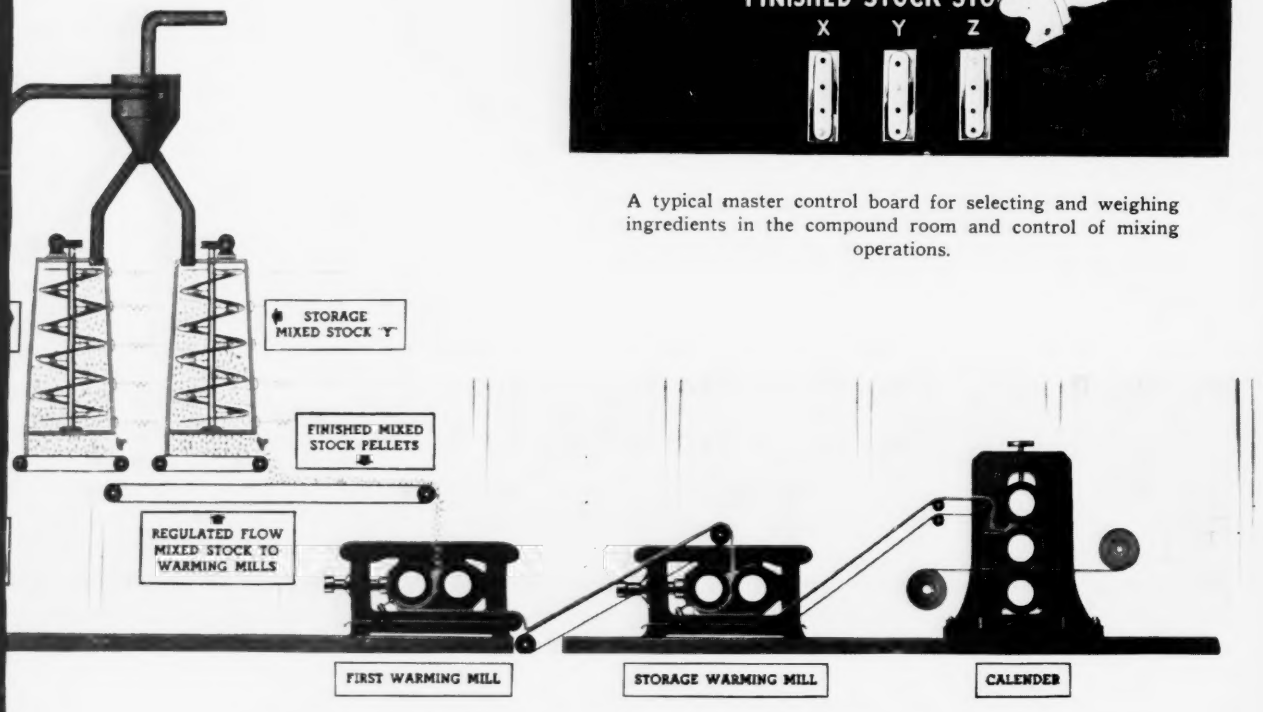




Close-up view *(top)* of Selsyn operated poise on scale beam and *(below)* the weight selector and operating push buttons.



A typical master control board for selecting and weighing ingredients in the compound room and control of mixing operations.



FINAL PROCESSING. From the storage bins the mixed stock pellets flow to warming mills in a regulated, continuous stream. On the first warming mill the pellets are converted into a ribbon which goes to a storage warming mill that supplies stock to calender or tubing machine.

Infra-Red Equipment and Its Use

John E. Garrod[1]

Electrified Industry

The Author beside an Infra-Red Unit at the Hood Rubber Co., Which Dries Adhesive Treated Canvas Shoes on a Conveyer Belt

RECENTLY there has been a greatly accelerated interest among manufacturers in the possibilities of infra-red heating devices for drying, curing baking, and other industrial applications. Why this new interest? What is infra-red? What equipment is required? What are the principles of application? Where might it fit in the rubber industry?

The modern industrial use of infra-red was pioneered in 1933 by the Ford Motor Co. in connection with the introduction of synthetic resin enamels for car finishes. That company holds patents Nos. 1,998,615 and 2,057,776 covering the use of infra-red for drying enameled surfaces. As it has been the company's policy to allow use of this method upon request without royalties of any kind, it has been adopted quite generally throughout the paint finishing industry.

Since then, encouraged by the many successful applications of this nature and the availability of well-designed equipment, many other industries have taken it up with enthusiasm, and there are now literally hundreds of successful installations ranging from the melting of solder to drying of special inks; while a like number of additional applications are still in the experimental stage.

Principle of Action

That there is nothing new under the sun is particularly pertinent in this case as "old man sun" has been warming us with radiant energy since the beginning; and infra-red is radiant energy. Many theories have been advanced to account for the rapid results obtained, particularly with drying of paint films. The claims have varied from catalytic increase in polymerization reaction to ultra-rapid solvent volatilization which caused breaking up of molecular structure of the solvent. Other theories based the results on the absorption of heat by the metal backer only, after being transmitted through the paint film unchanged, notwithstanding actual instances of drying on glass and non-conductors, such as wood, hard rubber, etc. Regardless of exaggerated claims, in the majority of cases this new tool of industry is largely an intelligent adaptation, by use of modern equipment, of one of the three fundamental ways of transferring heat—conduction, convection, or radiation.

Conduction requires a solid medium for transfer from molecule to molecule as, for example, contact with the heated platens of a press. While in convection the transfer is made indirectly by a liquid or gas convector as in a hot air oven. Radiation does not require solid, liquid, or gas as a transfer medium. Radiant energy from the hot body is transmitted from its source through space direct to the surface which it heats. This characteristic, if properly appreciated and utilized, permits very economical heat transfer as no heat need be lost in making the transition between source and recipient. Upon absorption by bodies which it strikes, the infra-red radiation is transformed into heat. Transfer may be at various wave lengths, but the method under discussion relies primarily on the use of infra-red or near infra-red energy with most of the energy involved between the visible light rays and those of a wave length of about 22,000 angstrom units.

Sources of Radiation

Any incandescent body with a temperature of 1,500° K. will serve as a source of such radiation. Here again "old man sun," with a temperature of 6,000° K., is an ideal radiator except for some lack of portability which limits industrial application. Resistance strips can and have been used. They lose some efficiency because of air cooling and are not as free from fire hazard as lamps. Carbon lamps which operate at perhaps 2,200° K. fill the requirements and are a good source though experience would indicate that their life is shorter than that of the tungsten filament lamp. It was at one time considered in some quarters that the relatively long-wave radiation from carbon lamps was particularly desirable, but subsequent tests have shown that a tungsten-filament lamp burning at normal temperature produces equal results. An ordinary Mazda lamp with a temperature of about 3,000° K. is a perfectly satisfactory source as 80 to 90% of its output is radiant energy. Since it is designed for high luminous efficiency, it has a relatively short life (750 to 1,000 hrs.). Specially designed drying lamps with lower luminous efficiency, but equal total energy radiation have a theoretical life in the order of hundreds of thousands of hours due to the lower temperature at which the filament operates. Service life, being influenced by other considerations such as vibration, shock, mechanical handling, and abuse, will be considerably below the theoretical but, with well-designed equipment and care, probably will be not less than 15,000 hours. Standard drying lamps are available in 250-, 500-, and 1,000-watt capacities and of various shapes and special characteristics to meet the various requirements of production.

Lamps are built primarily for service on 110-volt circuits and are probably best used in this manner. However they are used in series circuits in some cases as, for example, when existing feeder capacity is limited and new feeders would require long runs and thus greatly increase

[1] Physicist at Hood Rubber Co., Inc., Watertown, Mass.

installation expense. If so used, wiring, switches, etc., must be suitable for the high voltage service. Three-phase circuits must be reasonably well balanced to avoid excessive inductive heating. Failure of one lamp will shut down a whole series, and this type of wiring must be avoided if such an occurrence is a serious consideration in connection with production.

Reflection Mediums

Having a suitable, long-life, inexpensive source, we turn next to the question of reflectors. Infra-red rays travel in straight lines and may be focused and directed by means of lenses and reflectors as with light rays. As our infra-red sources are also light sources, the visible light forms a convenient rough index of infra-red distribution, though a careful measurement of intensity by a thermopile (convenient units are watts per square inch) may be required for more critical applications or exact experimental data. It follows that infra-red rays cast an invisible shadow which coincides with the shadow cast by the visible rays from the same source so that lamps and reflectors should be designed and distributed to avoid visible shadows. Most of the visible light can be screened out if desired for some special reason, although it is not usually attempted as it increases equipment cost and reduces efficiency. The lamps may be operated in any position—base up, down, horizontal, or at an angle so that heat may be directed to any face of the object to be radiated.

Reflectors must be highly polished, easy to maintain, and resistant to corrosion under operating conditions. Reflectivity in the infra-red region is not identical with that in the range of visible wave lengths so that materials with high visible reflectivity may not necessarily be so suitable for infra-red. Some are not usable for practical reasons. A silver surface with initially high reflecting qualities oxidizes rapidly so that its initial high efficiency lasts only a few hours. Copper likewise fails to maintain its initial high efficiency. On the other hand nickel which retains its original efficiency for long periods has a comparatively low initial efficiency and absorbs considerable of the energy so that nickel reflectors get very hot in operation. Gold-plated reflectors have the highest reflectivity of those commercially available, with polished Alzak (aluminum) a close second. Thin transparent coatings to protect surfaces and facilitate cleaning are now on the market.

The so-called reflector-type lamps are in increasing demand. They have a reflecting metallic coating flashed on the inner surface of the bulb and hermetically sealed in making it free from oxidation and fumes. Cleaning usually requires only wiping the smooth external surface with a damp rag. They can be backed up with Alzak or Alcoa lighting sheet to reflect strays and redirect radiation.

Commercial reflectors are built for a single lamp source and used in side-by-side, or staggered clusters to cover large fields. True strip-type units in which a single reflector serves many bulbs and which may in some cases replace the usual multiple units are reported as being on their way to market. The simple parabolic shape is used for concentrating reflectors though modified arrangements of spherical section are available and some manufacturers specialize in compounded units designed to provide ultra-uniform intensity fields. Others strive for greater efficiency by use of a combination of spherical sections. Ellipsoidal reflectors can be built to concentrate energy in one spot for special applications.

Oven Assembly

Almost all early ovens were merely a skeleton framework just sufficiently rugged to support the combination of drying lamps, sockets, reflectors, wiring, and switches. They were open at sides, top, and bottom. The tendency in custom-built design today is toward the use of reflector-type bulbs projecting through an otherwise continuous reflecting sheet between bulbs and sockets. There is no question but that these enclosed ovens are more efficient for the average job. Any material or surface being radiated reflects some of the radiant energy; the quantity depends upon shape, character, and color of the treated object. This energy, plus that which entirely misses its target, is lost if not reflected back on the material. As mentioned, reflection may be accomplished by use of the Alzak (or polished aluminum) sheet back of the lamps. When the unit can be designed so that lamps and sheet form a continuous reflecting face and the reflecting sheet can be placed so that bulb stems project through holes in the sheet, with the sockets behind the sheet, lamp bases, sockets, and wiring are protected from direct radiation. As the lamp base is the weakest point of the screw base units, the reduction in operating temperature results in longer bulb life. The sheet serves additional functions; namely, that of reducing cold drafts which reduce the temperature of the work and at the same time acting as a flue to carry off fumes or moisture laden air. A little study of design will result in optimum controlled-draft conditions and will increase oven efficiency by elimination of excessive cooling losses while maintaining adequate circulation. The enclosure protects nearby workers from glare and any chance of discomfort from heat of stray radiation. As aluminum sheet is now difficult to obtain, it is hoped that an inexpensive substitute of high reflectivity will be developed shortly. Aluminum paint offers hope in this connection. Its reflectivity varies with the vehicle employed and increases with solid content. So far none of the paints available are entirely satisfactory in all respects, but improvements appear probable.

Sockets of good commercial grade are satisfactory. Porcelain-shell medium screw sockets are used with the 250-watt lamps; while 500- and 1,000-watt lamps require medium bipost sockets. Channel strip is convenient for wiring which should be of heat resistant type, preferably varnished cloth asbestos covered or its equivalent.

While some of the adjustable infra-red tunnels on the market are suitable for temporary or experimental use, the very best units for a definite job are those designed for the specific purpose. They may vary from a unit of a few lamps used to warm a small part to a unit many feet long containing hundreds of closely spaced lamps to provide intense radiation. Lamp banks may be portable and moved to the product. They may be flat and mounted in either a vertical or horizontal plane, or they may be complete tunnels round or oval in contour or of very irregular cross-section to match the product for which they were designed. There are so many factors to be considered in each installation that it would be tremendously difficult, if not impossible, to make the design entirely on a theoretical basis. It is almost always easier to base the design on results of actual trials with experimental equipment in the field. Many of the equipment manufacturers and some of the larger and more progressive public utility units have experimental ovens which they are glad to loan for this purpose. They are continually running experiments on a variety of products and will make recommendations which may even include an estimate of probable cost saving. If such a laboratory is within reach, it may well provide the basis for efficient design; otherwise it is prob-

ably desirable to set up an experimental unit. Usually this experimental equipment can be reused or incorporated as part of the final unit so that little, if anything, is lost and much may be gained. It is desirable to duplicate, experimentally, as closely as possible the concentration of energy which will be required in the final installation. The ideal experimental unit should be large enough to radiate the entire sample, although if work is small or flat, a small section will provide good correlation. If large, the experimental unit might be a section of oven long enough to cover the object under test.

Distance from reflector to work is, within limits, not very critical when units are in large banks or tunnels. Mounting distances of six inches to 18 inches are common, and spacing of lamps along the tunnel is frequently the same as the distance from the work. Losses tend to be reduced by spacing close to the work and intensity is somewhat increased, but distribution of energy over a large surface may be "spotty" with maximum intensity directly under the lamps. Sometimes a "zone-type" oven is used to obtain desired results with maximum efficiency. The leading end may contain few lamps widely spaced for initial slow warming followed by a section of high intensity for high-temperature bake and then a medium-intensity soaking section. If volatile solvents are being given off, it may be best to start with an unheated section of the conveyer or tunnel, allowing a major part of the more volatile solvent to evaporate without heat. The system should be equipped with an exhaust system to reduce flammable vapor concentration if necessary.

Practical Installation

As electric heat is usually several times as expensive on a cost per B.T.U. basis as steam or oil, it would be difficult to justify its use as a source except on the basis of some extra advantages such as low initial equipment cost, process simplification, improved quality, etc.

While frequently used in stationary jobs such as drying of molds, trays of material, etc., the method seems best suited to conveyerized processes. Irregularities in radiation intensity can more readily be ironed out during passage through the radiant field. Drying or curing in transit, or between processes, on the way to the packing room, etc., eliminates handling expense and stacking, unrolling, loading, and unloading, which may well be a larger expense than the entire fuel cost. In some cases the reduction or elimination of warm-up time necessary with convection ovens is an important factor. Greater speed is usually possible and may eliminate costly bottlenecks in production. There are many cases on record in which drying time has been reduced 70 to 90%. Infinite flexibility is readily obtained by the use of multiple circuits and switches. Response is immediate as contrasted with the temperature lag of more conventional driers. The tunnel, or oven, may be tied in with the conveyer drive so that it goes into an immediate "black out" if the conveyer is stopped. Stored heat is so small that the product in the oven during an enforced shutdown is not overdried or overcured. Heat is immediately available when wanted without any long warm-up period. Tunnel structure is so light in weight that it can be readily relocated to meet changing production requirements and presents no storage problem if use is seasonal. It is so compact that it can be inserted into an otherwise unusable location. Units are frequently suspended overhead to free floor space for production use. There need be no stand-by loss as energy may be turned on or off as needed. There are some long tunnels in operation in which an ingenious switching arrangement automatically turns on the lamps ahead of material and shuts them off after it has passed. One or more walls of the oven may be movable so that tunnel size can be increased or decreased to accommodate a variety of products of different sizes.

Fire Hazards

There are no particular fire hazards introduced with conventional infra-red equipment. In fact by slight modification it can be made one of the safest drying systems for use where flammable vapors are present. The lamp filament has sufficient afterglow so that flammable vapor would be ignited if the bulb were broken. The usual precautions should be observed, and flammable vapor concentrations maintained below the lower explosive limit at all times by adequate ventilation. In cases of high vapor concentrations the lamp units with bulbs sealed into reflectors with lens faces are of some value in reducing fire hazard because of the extra glass wall. These lenses absorb some of the energy, and many consider this loss of efficiency is too high a price to pay for the additional safety feature and increased uniformity of heat distribution claimed by virtue of the lens.

Application to Rubber Industry

The characteristics mentioned would seem to fill a variety of needs in the rubber industry. While the magical penetrating qualities of infra-red heating units are apparently largely mythical as an advantage in curing items of thick section such as tires, heels, soles, etc., they do supply heat at, or just under, the surface and may have a field in curing thin sections, sheeting, etc. There is still much to be learned about the effect of pigments, metallic loading, etc. Laminated samples show unexplained tensile results in some cases. Drying and conditioning of both naphtha and latex cement coatings offer an excellent application. Instances are reported in which drying times have been reduced from a matter of minutes or hours to but a few seconds' exposure. Variations in relative humidity and ambient temperature which cause extensive variations in speed of air drying are frequently no longer a matter of vital concern when drying with infra-red. Softening of hard rubber sections for subsequent forming operations is worthy of investigation. Wire coating and covering and curing of thin walled tubed sections present possibilities. Warming of preforms before press cures and many other possibilities suggest themselves. Products surface finished with synthetic resin coatings can be dried in a fraction of the time required for air drying. Here, if anywhere, the penetrating quality of the rays may be of special value in drying from the inside out. The drying of these films on non-conducting backing may be faster than is the case with films on metal which tends to remove the heat rapidly. Care may be required to insure a uniform field of radiation as the leveling effect of the conducting metal is lacking. It should be remembered that maximum advantages in both quality and quantity of output are gained only by using a finish especially formulated for use with infra-red drying. Your regular supplier of finishing material should be asked for advice, and perhaps even a specialist in this field should be consulted. If present finishes were designed for air drying, it is almost axiomatic that, while infra-red may improve present conditions, the maximum improvement will not be attained until the finishing material is shifted to fit in with the new process.

(*Continued on page 96*)

Distribution of Automobile Tires 1939-1940[1]

W. W. Leigh[2]

THE shifts in tire distribution in 1940 were not great although they were of considerable significance to the industry. According to latest reports, tire shipments as compared with 1939 were as follows:

TABLE 1. TIRE UNIT SHIPMENTS BY MARKETS 1939 AND 1940
(000 Omitted)

Markets	1940	1939	Change over 1939 Unit	%
Total	58,775	57,509	1,266	2.2
Car manufacturer	22,254	18,208	4,046	22.2
Export	1,176	1,279	—103	—8.4
Replacement	35,345	38,022	—2,677	—7.0

The dollar volume of shipments remained almost constant for while the volume of shipment increased, unit price declined from $8.46 to $8.16.[3]

Replacement Sales by Channels

Table 2 shows unit tire sales by channels for 1939 and 1940 as well as percentage of total shipments.

TABLE 2. AUTOMOBILE TIRE SALES BY CHANNELS. YEARS 1939 AND 1940
(000 Omitted)

Channels	1939 Units	1939 %	1940 Units	1940 %	% Change 1940 from 1939
Total	38,000	100.0	35,345	100.0	—7.0
Major oil companies	5,888	15.5	6,010	17.0	2.1
Private brands	2,455	6.5	2,530	7.2	3.1
Tire manufacturers' brands	3,433	9.0	3,480	9.8	1.4
Mail order	2,028	5.3	1,573	4.4	—22.4
Chains	7,095	18.7	6,906	19.5	—2.6
Owned stores	6,154	16.2	5,920	16.7	—3.8
Associates	941	2.5	986	2.8	4.8
Miscellaneous special brands	578	1.5	305	0.9	—47.2
Tire manufacturer owned stores	2,975	7.8	3,205	9.1	7.7
Cooperatives	250	0.7	304	0.9	21.6
Department stores	160	0.4	150	0.4	—6.3
Factory direct	371	1.0	426	1.2	14.8
Dealers	18,655	49.1	16,466	46.6	—11.7

Dealer sales declined 11.7%, or considerably more than did total replacement sales. This recession affected dealers of smaller companies much more severely than it did the 1 [illegible] companies. For while the "Big Four" (Firestone, Goodrich, Goodyear, U. S.) dealers declined some 195,000 units between the two years, the smaller companies lost in total 1,994,000 units. Some few of the smaller companies, as did the "Big Four", escaped with slight dealer losses.

Major oil companies advanced their sales position 2.1% in 1940. The private branding companies fared better than did those selling manufacturers brands. This was due primarily to the sales of the Standard Oil companies. In addition to the major companies, oil jobbers and marketeers sell another 2,500,000 units. These jobbers receive dealer prices and function as dealers; so they are included as dealer volume.

The expansion of oil outlet sales is perfectly understandable when the growth of oil outlets is considered. The following table portrays this change for the years 1929, 1935, and 1939.

TABLE 3. NUMBER OF FILLING STATIONS AND TOTAL AUTOMOBILE OUTLETS 1929, 1935, AND 1939

Year	Filling Station Number	Filling Station Index	Total Automobile Outlets Number	Total Automobile Outlets Index
1929	121,513	100	69,379	100
1935	197,568	163	50,459	73
1939	241,856	209	60,128	87

Source: Bureau of Census.

Mail-order sales dropped in 1940 22.4%. This refers to catalog sales only. Mail-order catalogs, which were set up before the November, 1939, price decrease occurred, were priced out of line, and sales were adversely affected.

Chain stores, which include the Sears and the Ward stores, declined 2.6% in unit sales although their position moved upward from 18.7% of replacement sales to 19.5%. The large chains were primarily responsible for this advance as the following figures show:

TABLE 4. SALES OF LARGE AND SMALL CHAINS COMPARED

Group	% Change 1939 to 1940
Five large chains	1.5
Small chains	—16.0

Manufacturer-owned stores increased their sales volume by some 230,000, or 7.7%, during 1940. Three of the "Big Four" operate the large volume chains in this category; so we would expect their sales to show up well. But the owned stores were also in the best position to promote the tire sales that characterized 1940 and to operate successfully the "step-up price program" operated in conjunction with them.

Factory direct sales increased 14.8% and tire sales by cooperatives by over 21.6%. Part of this latter increase was due to extending our coverage of this group.

Sales of Distributer Brands vs. Tire Manufacturers' Brands

The growth of private branded merchandise seems to have been very rapid generally during the past few years. This has certainly been true in the tire field. However, the upward trend has been reversed, at least temporarily, in 1940. The growth of private brand tires by channels is shown in Table 5.

Conclusions

From the data received a few conclusions other than those of fact which are indicated in the tables seem warranted.

1. Every evidence indicates a continuing diversification of tire outlets. This diversification will most likely continue.

2. The year 1940 clearly shows that large-scale distribution breeds market instability rather than stability. From the price and competitive standpoints the situation is familiar to every one. But this year also witnessed considerable unstability in production schedules of many

(*Continued on page 78*)

[1] Abstracted from the author's annual summary report released April 23. The data on tire sales have been derived primarily from the reports submitted by tire manufacturers who are responsible for approximately 28,000,000 of the 35,500,000 replacement tire sales. In addition, most of the large mass distributing companies, as well as a number of smaller chains, supplied information as to their sales. The estimates based upon tire shipments rather than retail sales involve some error, since some data were on one base and some on the other. The estimates as to retail sales would have been more difficult and would have been subject to a greater degree of error. The author acknowledges his appreciation of the cooperation of tire manufacturers, chain organizations, mail-order houses, and oil companies selling tires.

[2] University of Akron, Akron, O.

[3] D[illegible]ed from Bureau of Census figures for 1939. Adjustment made by the [illegible]posite Wholesale Price Index for Automobile Tires and Tubes," [illegible]reau of Foreign and Domestic Commerce for 1940.

Molded Composition Basketballs

John T. Clark[1]

PRIOR to 1934 basketballs, footballs, and similar balls of the inflated type utilized a separate bladder that was placed within a casing made by sewing panels of leather and canvas together simultaneously. Basketballs made in such a manner were rarely round at every point and usually stretched out of shape quickly. They had "dead" spots at the ends where the seams met and bounced erratically on the laces.

Inception and Development of the Molded Ball

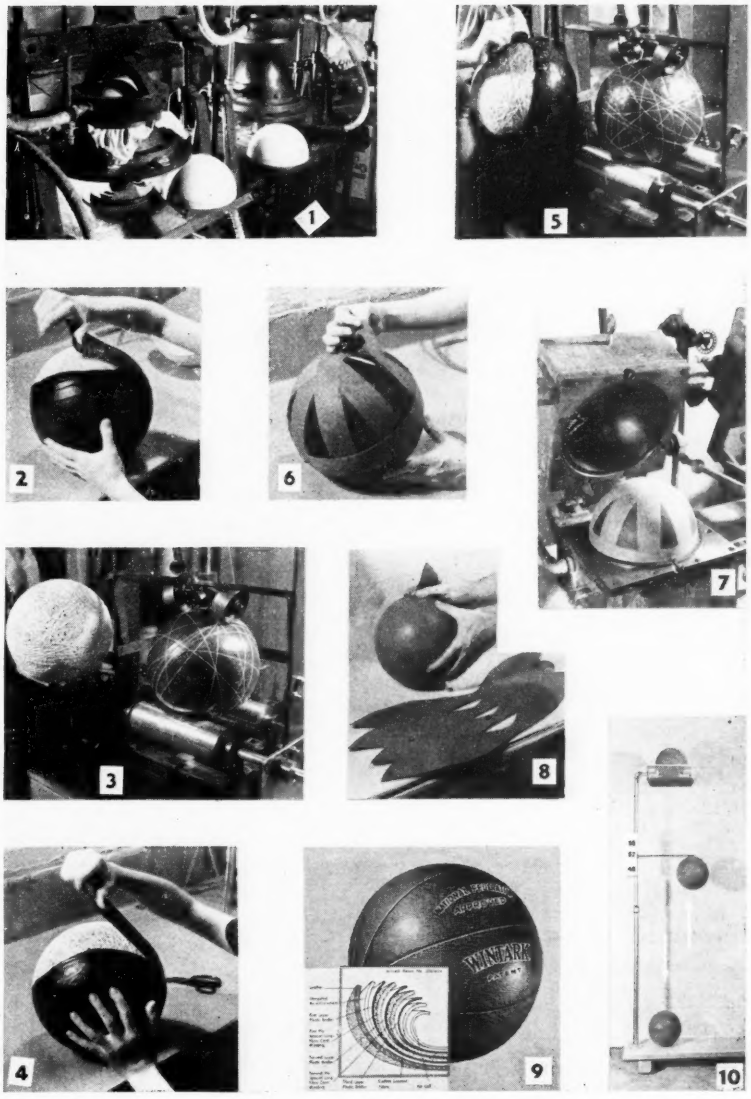
Before that time molded balls were either of the all-rubber type or made like tennis balls by vulcanizing two rubber halves together and cementing fabric over them.

Somewhat previous to 1934 the National Federation of State High School Athletic Associations, at the instigation of H. V. Porter, its secretary, had endeavored to persuade several large sporting goods companies and rubber manufacturers to become interested in making a basketball that was built up and molded in much the same way as a tire. After several years of fruitless effort, Mr. Porter commissioned H. T. Winterbauer to undertake the task. Early in 1934, Mr. Winterbauer formed a partnership with the author who was then in the rubber business in Chicago (thus the name Wintark), and experimental work was begun.

In the early development the weight limit of 22 ounces, together with an exterior surface of 270 square inches, provided a serious obstacle. Also for the project to be a success, it was evident that material and labor costs must be kept low and that manufacture must be such that modern high-speed production methods could be employed.

One of the first methods tried involved the use of seven- and nine-piece wooden forms which, after being covered with frictioned material, were removed through a small opening. Also balls of rubber were employed as a base over which the fabric was placed. Numerous other methods, including the use of a sewn canvas ball as a primary interior to build on, were tried and discarded.

Finally the author and Mr. Winterbauer stumbled on to the successful method described below and in November, 1934, applied for a patent[2] which was granted in 1936. This patent is generally considered to be the original patent on fabric-lined molded athletic balls.



Steps in the Production of a Leather-Covered Ball

(1) The Fabric Is Stamped into Hemispheres; (2) After the Hemispheres Are Placed Over an Inflated Bladder and Joined Together, a First Layer of Rubber Is Applied; (3) A First Layer of Cord Is Wound over the Ball; (4) Over the Cord a Second Layer of Rubber Is Applied; (5) A Second Layer of Cord and a Third Layer of Rubber Are Applied; (6) Reenforcing Strips of Frictioned Canvas Are Placed over the Core Where the Groove Seams of the Leather Will Appear; (7) The Built-up Carcass Is Placed into a Vulcanizer Where the Layers Are Cured Together into a One-Piece Sphere; (8) Panels of Pebble-Grained Cowhide Are Applied in Patterns Cut to Fit in Lines Molded in the Core of the Ball; (9) The Finished Ball Has Nine Layers of Material; (10) A Dropping Machine Tests the Balls to Check their Bounce to a Uniform Reaction of 52 Inches When Dropped From a Height of Six Feet

Method of Manufacture

The method decided upon involved the shaping of two pieces of canvas into hemispheres, allowing an overlap for joining. These segments are placed over an inflated bladder, with a thin layer of rubber between the fabric at the overlapping joint. The assembled sphere is then placed into a mold of the proper size and air pressure applied; the tackiness of the rubber is such that the two

[1] President, Wintark, Inc., Cicero, Ill.
[2] U. S. patent No. 2,061,604, Nov. 24, 1936; U. S. reissue patent No. 21,115, June 13, 1939.

halves adhere sufficiently for further processing. Over the canvas ball thus formed, a layer of practically pure gum sheet stock is applied. This stock and that used in subsequent layers are of low gravity to keep the weight down and are thoroughly plasticized to insure thorough impregnation of canvas and cord in the final molding operation. The layer of rubber is followed by a winding of rayon tire cord.

Originally a long-fiber cotton cord was used as a winding, but this was displaced recently when Wintark, through an arrangement with E. I. du Pont de Nemours & Co., Inc., and a leading tire company, was granted the use of Cordura, du Pont's rayon cord. This, when used with a special adhesive developed by the rubber company, bonds with rubber. A Cordura cord 0.008-inch in diameter is 60% stronger than long-fibre cotton cord 0.014-inch thick, tests have shown, and thus gives a ball of greater durability. In the winding development, considerable experimentation was also necessary to produce a machine that would perform this operation without distorting the shape of the ball. This machine, which winds in great arcs, distributes the cord evenly and in perfect patterns over the surface.

Over the first winding of Cordura, a second layer of rubber is applied, followed by a second winding of Cordura and another thin layer of rubber. From this point manufacture may proceed in either of two directions, depending upon the type of cover desired—leather or rubber.

In the case of the leather-covered ball, strips of friction canvas are applied over the surface to give proper protection immediately under the groove seams which will appear in the leather cover. The sphere is then placed into a curing mold where all layers are vulcanized into a one-piece perfect sphere under the influence of air pressure and heat. During this step lines are molded into the surface of the carcass to indicate the position of the leather sections. These panels, of high-quality pebble grained cowhide, are cemented to the carcass to complete the ball.

Where a rubber-covered ball is desired, the core is entirely covered with a ply of frictioned drill, which not only protects the cord, but makes it possible to mold a cover on the ball without the cord showing through. To complete the building-up process, a layer of abrasive resistant rubber stock, which is to serve as the outer cover, is evenly applied over the frictioned drill. To give the cover a leathery quality, leather fibers may be incorporated in the mix. The built-up ball is placed into a mold, inflated to 90 pounds per square inch pressure, and then deflated to 60 pounds' pressure, followed by vulcanization at 65 pounds per square inch steam pressure for 12 minutes. During the cure the various layers of fabric and cord mold together to form a unit sphere with a wall of uniform thickness and strength. The mold produces a pebble-grain finish with grooves for proper grip and accuracy in handling. The rubber-covered molded basketball has lowered the price and opened up new fields of sport because it can be used on any type of ground or floor surface without rapid wear of the ball's covering.

Different versions of the wound ball are now in evidence. In one case the ball is wound over a wax core with holes cleverly placed so that the wax may be melted for removal and a bladder inserted before final curing. The molded inflated ball has assumed a definite place in the athletic goods industry and should save schools many dollars in the years to come.

Horsepower and Fuel Use in the Rubber Industry

In the rubber products industry 579 out of 595 establishments reported the use of power equipment in 1939, according to a summary of the nation's use of its horsepower in 1939 issued by the Industrial Reference Service, United States Department of Commerce, Washington, D. C. This census survey, the first since 1929, showed that most of the aggregate horsepower of the prime movers in the rubber products industry is supplied by steam turbines.

The total aggregate horsepower of the prime movers in all industries is 21,266,557. The corresponding figure for the rubber products industry is 288,170 h.p. The breakdown of this figure for the rubber products industry follows: 385 steam engines, 33,814 h.p.; 150 steam turbines, 251,193 h.p.; eight Diesel and semi-Diesel engines, 1,433 h.p.; five other internal combustion engines, 270 h.p.; as well as six hydro-turbines, water wheels, 1,460 h.p.

The total kilowatt rating was 167,248, with 7,130 kilowatts being driven by steam engines and 158,870 kilowatts by steam turbines.

In another census survey from the same source, 567 establishments in the rubber products industry reported the use of fuels as follows: anthracite, 23,169 tons; bituminous coal, 1,847,679 tons; coke, 686 tons; fuel oils, 670,605 barrels; natural gas, 3,732,453,000 cubic feet; manufactured gas, 1,035,782,000 cubic feet; and mixed gas, 57,893,000 cubic feet.

Production and Sales of Rubber Chemicals Up in 1940

According to a preliminary report by the United States Tariff Commission on the production and sales of synthetic organic chemicals in the United States during 1940, rubber chemicals scored sharp gains over the 1939 figures.[1] Increases (weight) in 1940 over 1939 were as follows: total coal-tar rubber chemicals—24.0% production, 33.7% sales; coal-tar accelerators—38.4% production, 67.2% sales; coal-tar antioxidants—14.1% production, 13.9% sales; total non-coal-tar rubber chemicals—28.9% production, 29.0% sales. The figures for 1940, including several specific chemicals, are shown in the table below.

	Production	Sales		
	Pounds	Pounds	Value	Unit Value
(A) Coal-tar: Total	37,139,394	28,024,769	$13,599,760	$0.49
Accelerators, total	16,736,874	12,998,019	6,370,558	.49
Butyraldehyde aniline	482,964	.....	.....	..
Diphenylguanidine	1,448,504	1,279,701	427,086	.33
Mercaptobenzothiazole	5,438,933	.....	.....	..
Thiocarbanilide	404,838	.....	.....	..
Antioxidants, total	20,402,520	15,026,750	7,229,202	.48
Diphenyl-p-phenylenediamine	1,281,841	.....	.....	..
(B) Non-coal-tar: Total	16,915,139	15,353,009	3,747,437	.24
Accelerators:				
Tetramethylthiouram sulphide and disulphide	567,517	433,397	935,328	2.16
Zinc diethyl dithiocarbamate	51,775	.....	.....	..

Total sales of all synthetic organic chemicals in 1940 were valued at $484,000,000, an increase of 26% over 1939. Sales of synthetic coal-tar chemicals increased 18% to $218,000,000 in 1940, and non-coal-tar chemicals increased 33% to $266,000,000.

[1] India Rubber World, July, 1940, p. 48.

Naftolen[1]—A New Compounding Material for Rubber

Fritz Rostler and Vilma Mehner

THE process for producing Naftolen and the application of Naftolen in rubber compounding were originally developed at the University of Vienna by Fritz Rostler and Vilma Mehner, and patents were taken out in a number of countries. In 1938 the Wilmington Chemical Corp. obtained from Naftolen-Gesellschaft, Vienna, the United States and Canadian patent rights for the production of Naftolen. The Wilmington company also obtained the services of Drs. Rostler and Mehner, who are now in charge of the firm's laboratory. A pilot plant with a capacity of 2,000 pounds per day has been erected by the Wilmington Chemical Corp. and is now in operation in Wilmington, Del.

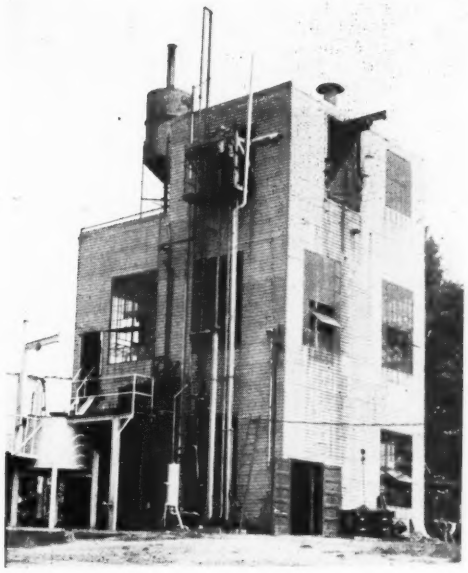
Arrangements are being made for large-scale production of Naftolen. It is expected that commercial quantities will be available not later than January, 1942. According to information available, Naftolen will be on the market in large quantities at a price appreciably lower than the price of rubber.

Naftolen appears to be a material with a wide range of application in the rubber industry. Of particular interest are its possibilities in extending rubber supplies in this country and the rubber chemist may find Naftolen helpful when reformulating his compounds to conserve rubber. Because of this, we have asked the authors to inform our readers about this new material. EDITOR'S NOTE.

NAFTOLEN, a new material for use in rubber compounding, is derived from certain acid sludges formed in the refining of mineral oils.[2] Acid sludge is known as a waste product available in practically unlimited quantities. This acid sludge has been found to be a source of a group of unsaturated hydrocarbons of relatively high molecular weight which heretofore have not been available for industrial use. Briefly described, from the point of view of the rubber industry, Naftolen is a vulcanizable plasticizer for both natural and synthetic rubber. Because it is capable of co-vulcanization with rubber, large quantities can be incorporated in rubber mixtures where it may also serve as a bulking agent or rubber substitute.[3] In Europe, Naftolen is used in large quantities to conserve supplies of natural and synthetic rubber. The material has also shown interesting possibilities in connection with hard rubber, latex, and reclaimed rubber.[4] Use of Naftolen in the plastics field has been developed more recently.

Origin and Process

The raw material used in producing Naftolen is selected acid sludge which contains addition products of sulphuric acid and certain organic substances. The organic constituents of these addition products are the basis of Naftolen. Neutralization and low-temperature distillation in the presence of catalysts are basic steps in production. The Naftolen is produced in five grades with different viscosities and ranging from fluids to solids.



Wilmington Pilot Plant for Production of Naftolen

General Properties

Naftolen is reddish brown in color, with a green fluorescence, and it has a specific gravity of about one and contains no components boiling below 320° F.; it is neutral, and its acid and saponification numbers are zero. Naftolen is soluble in almost all organic solvents, but insoluble in diluted alcohol and water.

Analysis shows the composition of the new product to approximate 90% carbon and 10% hydrogen, indicating the formula $(C_5H_4)_n$. This formula indicates unsaturation and explains the ability of Naftolen to react with sulphur in a manner analogous to that of rubber. In combination with rubber it is believed that sulphur bridges between the Naftolen and the rubber are formed during vulcanization.

The various types of Naftolen are of essentially the same chemical composition and chemical activity, but with the molecular weight ranging from 300 to 1,000. The most marked physical difference is that of viscosity, but all types are liquid at 212° F. Table 1 indicates viscosity differences of the various types. Naftolen R100 is of average composition, and the other types are components of R100.

TABLE 1

Type	Physical State at Room Temperature	Viscosity at 212° F. in Centipoises
Naftolen 510	Fluid	7
Naftolen 530	Viscous oil	16
Naftolen 550	Soft resin	67
Naftolen 570	Solid	540
Naftolen R100	Semi-viscous oil	21

The electrical properties of Naftolen are of interest in connection with cable compounds and other electrical products, and the electrical data for the type best suited for this purpose, Naftolen 550, are shown in Table 2.

[1] The trade mark "Naftolen" is registered in United States, Canada, and most of the European countries.
[2] U. S. patent Nos. 2,185,952, Jan. 2, 1940; 2,185,951, Jan. 2, 1940; 2,217,919, Oct. 15, 1940.
[3] U. S. patent No. 2,180,367, Nov. 21, 1939.
[4] U. S. patent No. 2,244,654, June 3, 1941.

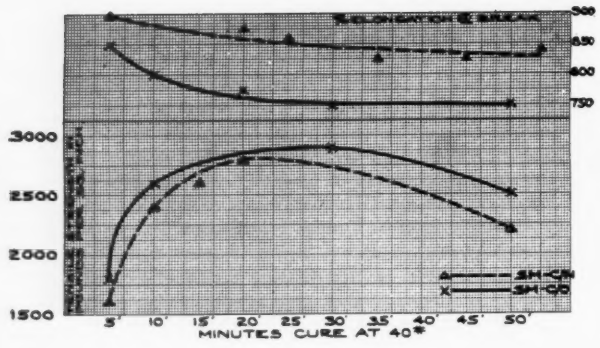


Fig. 1

TABLE 2. ELECTRICAL PROPERTIES OF NAFTOLEN 550

	Dielectric Constant	Power Factor	Loss Factor	Breakdown Voltage Kilovolts
10^6 Cycles and 70° F.....	2.57	0.0148	0.0381	..
60 Cycles and 70° F.....	4.77	0.077	0.228	48

Naftolen activates accelerators; thus mixtures containing it require a shorter vulcanization period than Naftolen-free mixtures, as has been shown by T-50 tests. This activating effect might be expected for two reasons. First, because Naftolen acts as a solvent for both rubber and sulphur, the vulcanization takes place in solution. Second, it has been found possible to separate from Naftolen a nitrogen-containing component which has a strong activating effect.

Soft Rubber Compounds

As previously mentioned, Naftolen is primarily a hydrocarbon material capable of co-vulcanization with rubber, and because of this fact can be used in rubber compounds in much larger amounts than necessary for plasticizing purposes only. Naftolen also acts as a dispersing agent for fillers, particularly carbon black. Naftolen appreciably raises the optimum amount of filler to be incorporated in the mix. Considerable amounts of fillers can be incorporated in a Naftolen-rubber mix before seriously affecting the physical properties of the vulcanizate.

Naftolen has some discoloring effect on the rubber. It should not be used for white and very light colored articles, but is suitable for all other types of rubber products.

It can also be used as an organic filler or bulking agent. Rubber mixes containing up to 50% Naftolen have been found suitable for practical use.

Naftolen has been shown to increase the age resistance of compounds, especially those containing carbon black and large amounts of sulphur. The solubility of sulphur in the new material retards blooming, and Naftolen can be used as a corrective for this purpose.

The adhesiveness of non-vulcanizing mixes for sealing tape, insulating tape, etc., may be enhanced by the use of Naftolen. It imparts good surface tack to rubber mixes, which point is of interest in tire compounding.

Certain precautions must be observed in mixing Naftolen-rubber compounds containing carbon black, and it has been found that the carbon black and Naftolen should be added separately for best results. To reformulate a compound containing carbon black to include Naftolen, the following rule may be applied as an approximation: 10 to 20% of rubber and all of the softeners (except stearic acid) may be replaced by one-quarter to one-third of

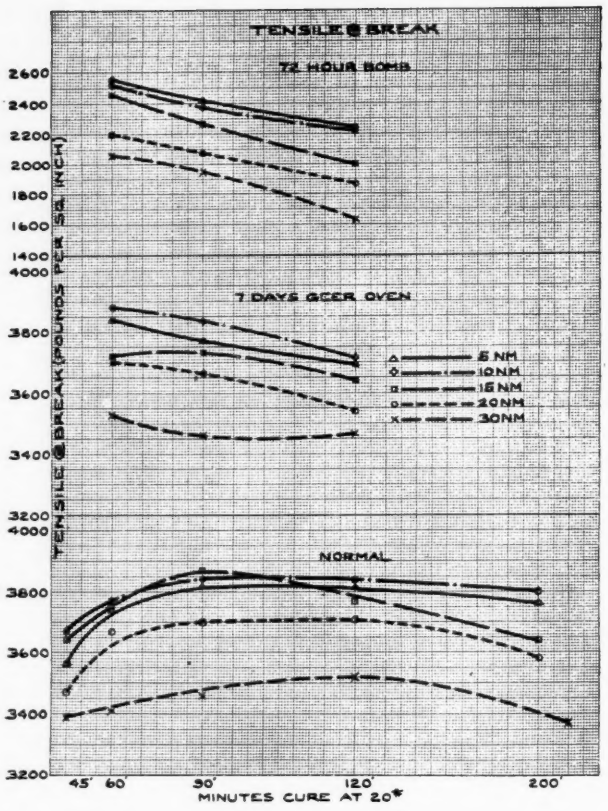


Fig. 2

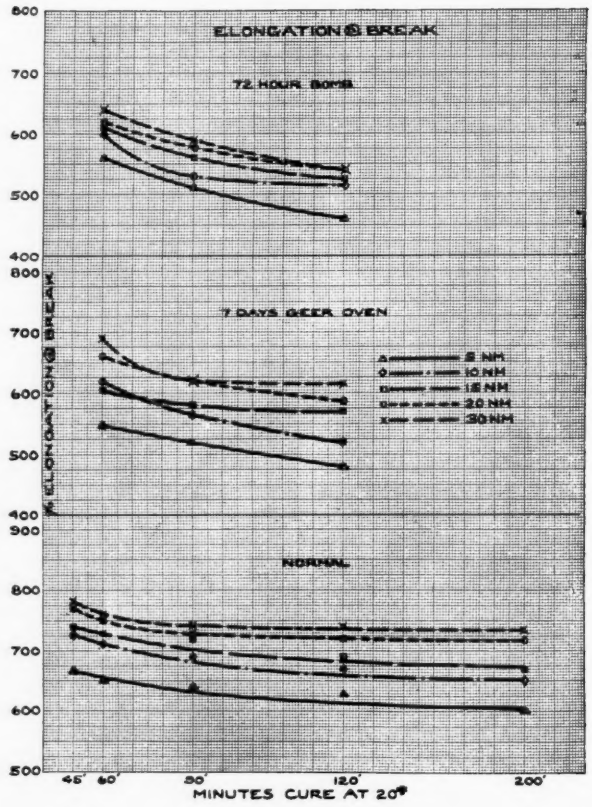


Fig. 3

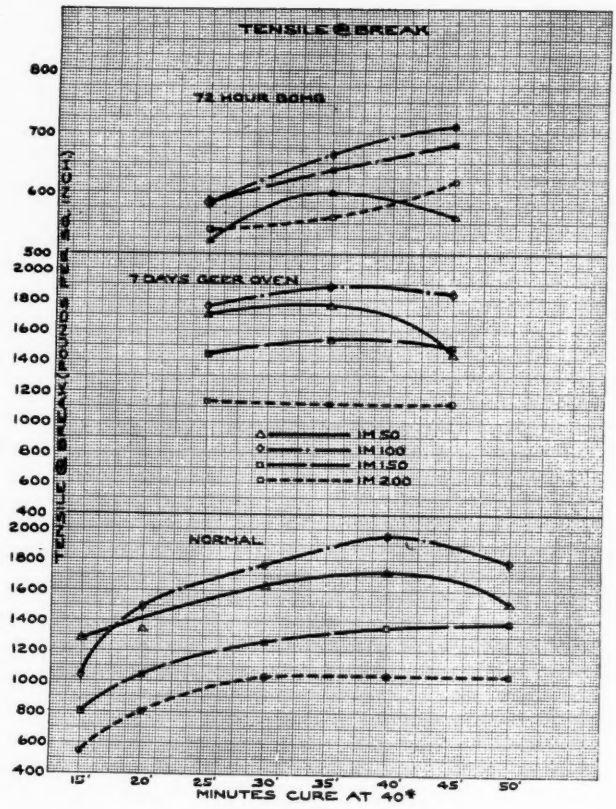


Fig. 4

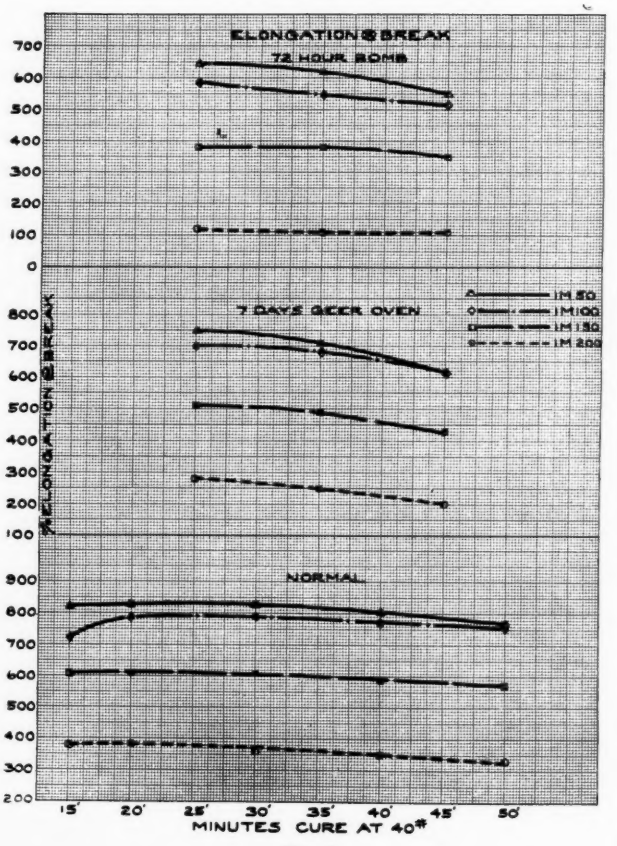


Fig. 5

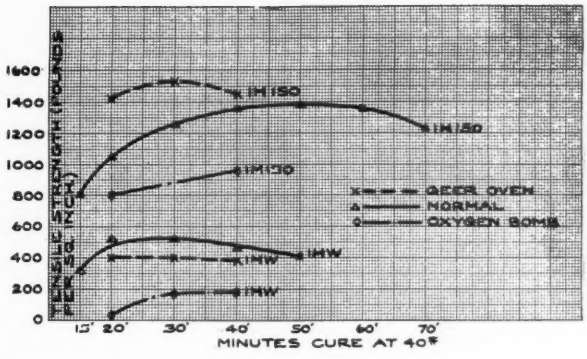


Fig. 6

carbon black and three-quarters to two-thirds Naftolen. In the case of stearic acid, one-half to one-third may be replaced as above.

It should be borne in mind that, because Naftolen enters into the vulcanization reaction chemically, it should not be used as an inert material. Thus to bring out the optimum properties in Naftolen-rubber compounds, special formulation is necessary.

The compounds and test data[5] presented below indicate the general characteristics of Naftolen-rubber mixes.

Table 3 shows two gum compounds with the tensile strength and elongation plotted in Figure 1. The Naftolen-rubber stock shows higher elongation and only slightly lower tensile than the pure rubber stock.

TABLE 3

Compound No.	Sm—C/N	Sm—C/O
Smoked sheets	100	100
Naftolen 550	30	..
Zinc oxide	10	10
Sulphur	3.5	3.5
Mercaptobenzothiazole	1	1

In Table 4 is shown a compound with a large quantity of Naftolen, together with physical test data. Such stocks before cure are soft and tacky and difficult to handle on a mill, but mixing can be accomplished quite easily in a Banbury.

TABLE 4

Smoked sheets	100
Naftolen 530	70
Mercaptobenzothiazole	0.35
D.P.G.	0.15
Stearic acid	0.50
Zinc oxide	6
Sulphur	3
Optimum cure	20 min. at 40 lbs. per sq. in.
Tensile at break	1,460 lbs. per sq. in.
Elongation at break	950%
Hardness (Shore Durometer A)	17

Data for the carbon black compounds in Table 5 are shown in Figures 2 and 3. Table 6 presents a series of compounds containing a large quantity of Naftolen and increasing amounts of carbon black, with data shown in Figures 4 and 5. In Table 7 are two compounds, one containing Naftolen, and the other, white mineral oil in the same amount and of the same viscosity as the Naftolen; tensile data are shown in Figure 6.

TABLE 5

Compound No.	5 NM	10 NM	15 NM	20 NM	30 NM
Smoked sheets	100	100	100	100	100
Naftolen R100	5	10	15	20	30
Mercaptobenzothiazole	1	1	1	1	1
Stearic acid	1	1	1	1	1
Zinc oxide	5	5	5	5	5
Sulphur	3	3	3	3	3
Channel black	60	60	60	60	60
Phenyl-beta-naphthylamine	1	1	1	1	1

[5] The data presented in these tables and charts were collected in V. L. Smithers Laboratories, Akron, O.

TABLE 6

Compound No.	1-M50	1 M100	1 M150	1 M200
Smoked sheets	100	100	100	100
Naftolen R100	70	70	70	70
Mercaptobenzothiazole	0.5	0.5	0.5	0.5
Stearic acid	0.5	0.5	0.5	0.5
D.P.G.	0.15	0.15	0.15	0.15
Zinc oxide	6	6	6	6
Sulphur	3.5	3.5	3.5	3.5
Channel black	50	100	150	200
Phenyl-beta-naphthalamine	1	1	1	1

TABLE 7

Compound No.	1 M150	1-MW
Smoked sheets	100	100
Naftolen R100	70	..
White oil	..	70
Mercaptobenzothiazole	0.5	0.5
Stearic acid	0.5	0.5
D.P.G.	0.15	0.15
Zinc oxide	6	6
Sulphur	3.5	3.5
Channel black	150	150
Phenyl-beta-naphthylamine	1	1

A tread-type compound is shown in Table 8 together with physical data.

TABLE 8

Smoked sheets	66
Brown crepe	34
Naftolen	9
Mercaptobenzothiazole	1.3
Stearic acid	1
Zinc oxide	5
Sulphur	4.25
Channel black	50
Phenyl-beta-naphthylamine	1.7
Optimum cure	45 min. at 22 lbs. per sq. in.

Cure Min. at 22 Lbs. Steam	Tensile at Break in Lbs. per Sq. In.		% Elongation at Break		Modulus at 300% Elongation		Set		Hardness-Shore Durometer		Abrasion (Du Pont)
	Normal	Aged 72 Hrs. Oxygen Bomb	Normal	Aged 72 Hrs. Oxygen Bomb	Normal	Aged 72 Hrs. Oxygen Bomb	Normal	Aged 72 Hrs. Oxygen Bomb	Normal	Aged 72 Hrs. Oxygen Bomb	Normal
15	2,760	1,440	700	620	380	430	28	44	49	45	...
30	4,560	3,150	737	667	840	1,040	55	74	50	62	273
45	4,630	2,990	717	603	1,070	1,350	63	75	64	66	145
60	4,480	2,860	680	567	1,180	1,440	64	73	65	68	133
75	4,240	2,800	660	553	1,260	1,510	64	72	66	69	...

Hard Rubber Compounds

It has been found that through the use of Naftolen and proper compounding technique marked increase in the tensile strength of hard rubber compounds has been obtained, especially in compounds containing reclaim. Also the high degree of plasticity in the uncured stock enables a maximum development of mold pattern. Sulphur bloom, which often leads to the formation of acids of sulphur on the surface of hard rubber products, is retarded by the use of Naftolen. The surface electrical properties are consequently improved by its use.

Figure 7 compares the properties of the hard rubber compounds presented in Table 9 which contain the different types of Naftolen without added filler. Table 10 shows a hard rubber battery composition.

TABLE 9

Compound No.	510	530	550	R 100
Smoked sheets	100	100	100	100
Naftolen 510	70	..	..	..
Naftolen 530	..	70	..	..
Naftolen 550	..	..	70	..
Naftolen R100	..	..	..	70
Sulphur	56	56	56	56
D.P.G.	1	1	1	1

TABLE 10

Smoked sheets	100
Reclaim	60
Naftolen R100	40
Hard rubber dust	200
Sulphur	70
Fossil flour	150
Barytes	60
D.P.G.	2
Optimum cure	120 min. at 58 lbs. per sq. in.
Tensile at break	5,800 lbs. per sq. in.
Specific gravity	1.49

The use of Naftolen in hard rubber compounds probably best demonstrates how its softening effect is eliminated through vulcanization. A comparison of the compounds without fillers given in Tables 4 and 9 illustrates that by varying the amount of sulphur very plastic Naftolen-rubber mixtures can be vulcanized to produce either hard or soft rubber and explains the use of the term "vulcanizable plasticizer" in connection with Naftolen.

Latex Compounds

Through the use of emulsifiers and stabilizers, Naftolen can be added to latex. One method of mixing with latex is to heat the Naftolen to 170° F., to add it with rapid stirring to a similarly heated concentrated latex, and to homogenize the resulting emulsion by passage through a preheated colloid mill. Naftolen 530 or R100 is used in amounts of between 15 and 30% based on the weight of dry material. Applications for latex-Naftolen mixtures include adhesives, sponge, and tank linings.

Reclaim

Naftolen has been employed (usually 10 to 20%) in the alkali or superheated steam reclaiming of rubber to give improvement in tensile strength and other properties, increased yield, and reduction in processing time.

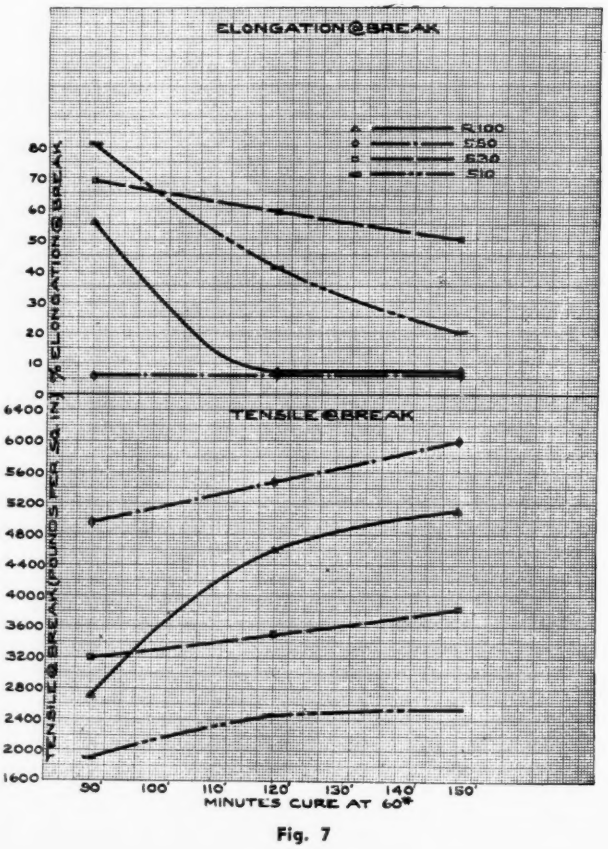


Fig. 7

The fundamental purpose of all reclaiming processes is to render scrap rubber plastic and capable of absorbing sulphur. The first function is served by the plasticizing action of Naftolen; while the second is achieved through the reactivity of Naftolen with sulphur. Under reclaiming conditions Naftolen, through dehydrogenation, reacts with sulphur liberating hydrogen sulphide. The sulphur absorbing capacity of Naftolen, in addition to consuming the free sulphur in the scrap rubber, renders the finished reclaim capable of absorbing additional sulphur. Because of its co-vulcanizing ability, the Naftolen, even though used in relatively large amounts, need not be removed subsequently from the reclaim. A further advantage cited is that reclaim thus produced is stable during storage and does not dry out.

The following method is one by which automobile tires have been successfully reclaimed by combined alkali and Naftolen treatment. The scrap rubber is placed in a closed agitation tank with 10 to 15% Naftolen (based on the scrap) and with 12% caustic soda dissolved in a quantity of water sufficient to cover entirely the scrap in the tank. The material is agitated and heated from eight to ten hours at 175 to 205 pounds per square inch steam pressure. In the usual manner the caustic soda is drained off, and the reclaim is washed, dried, refined, and strained.

In reclaiming with superheated steam but without alkali, slightly more Naftolen (15 to 20%) has been used to obtain reclaim of the desired plasticity.

Preliminary tests have indicated that Naftolen may have interesting possibilities in the reclaiming of synthetics.

Synthetic Rubber

Naftolen is known to be used in large amounts with synthetics in Europe. Although in this country development on this phase of application has begun only recently, the new material appears to be of definite interest in compounding synthetic rubber. Furthermore it seems possible to use Naftolen in such quantities as to offset at least to some extent the high cost of synthetic rubber. In general it has been found that proper compounding of synthetics with Naftolen must include greater quantities of fillers, less stearic acid, and somewhat more sulphur than usual.

Mixtures of synthetic rubbers with natural rubber, reclaim, and Naftolen are under investigation, with indications of promising results.

Chlorinated Rubber

In the use of chlorinated rubber for lacquers it is desirable to have a plasticizer that imparts good adhesion and also one that is unsaponifiable if the lacquer is to be used in applications where resistance to atmospheric influences and chemicals is important. As Naftolen is strictly a hydrocarbon, it is unsaponifiable, and in addition it has been found to exert a marked plasticizing effect on chlorinated rubber and to improve adhesion.

1940 Accident Rates in the Rubber Industry[1]

THE 1940 injury experience of the rubber industry is based on reports covering 55 plants whose 72,000 employes worked 133,906,000 man-hours, the largest coverage ever reported to the National Safety Council. Standings of the rubber industry were eighth (against tenth in 1939) in frequency and fifth (unchanged) in severity among 30 major industries.

The following facts briefly cover the important phases of the rubber industry's accident experience for 1940:

1. The 1940 frequency[2] rate was 8.27 reportable injuries per million hours worked. This rate was considerably below the all-industry average of 12.52.

2. The industry's severity[3] rate was 0.65-day disability per thousand hours worked. This rate was slightly less than half the average of 1.44 for all industries.

3. Rubber company frequency rates averaged 1% below 1939, but severity rates averaged 19% higher. The small reduction in frequency is slightly better than the unchanged average for all industries, but the sharp increase in severity compares unfavorably with the general reduction of 1%.

4. The cumulative reductions in injury rates since 1926 were 74% in frequency and 48% in severity. Results in frequency surpassed the average improvement for industry as a whole, but in severity progress has been slightly less than the cumulative decline for all industries.

5. Large plants continued to have the lowest frequency rates, averaging 7.69 for 1940. Small units again had the lowest severity rates, averaging 0.48.

6. Small plants reduced rates in comparison with 1939 and also led in improvement from 1932 with reductions of 13% in frequency and 32% in severity.

7. Footwear plants again had the lowest injury rates in the industry, averaging 3.45 for frequency and 0.11 for severity.

8. Only tire manufacturing plants had lower frequency rates for 1940 than for 1939. Severity rates decreased only in footwear plants.

9. Reports covering fatalities and permanent partial disabilities occurring during the last seven years show that the principal mechanical causes of such injuries were unsafe processes, poor housekeeping, and improper guarding. The principal personal causes were disobedience of instructions and other improper attitudes.

10. The Providence, R. I., plant of the United States Rubber Co. holds the best all-time no-injury record in the industry—5,688,369 man-hours; period of record, February 19, 1935, to October 7, 1936.

[1] Abstracted from "1940 Accident Rates in the Rubber Industry", National Safety Council, Inc., 20 N. Wacker Dr., Chicago, Ill.
[2] Injury frequency rate is the number of reportable injuries per million man-hours of exposure.
[3] Injury severity rate is the number of days lost as the result of reportable injuries, per thousand man-hours of exposure. This rate includes arbitrary charges for permanent disabilities and deaths, in accordance with the standard scale.

PROTOWAX, A PRODUCT OF L. SONNEBORN SONS, INC., is a petrolatum from which most of the liquid and semi-liquid hydrocarbon components have been removed and, unlike ordinary petrolatum, is of hard consistency. In respect to hardness the new product resembles paraffin wax, but in contrast to paraffin wax, which is crystalline in structure and brittle, Protowax is amorphous and possesses a high degree of plasticity. Physical properties include: melting point, 127 - 130° F.; specific gravity at 60° F., 0.898; and Saybolt viscosity at 210° F., 50-55; there are two grades—white and dark amber. Protowax, according to the manufacturer, is particularly satisfactory for softening rubber compounds and in retarding bloom in finished products.

EDITORIALS

Conservation of Crude Rubber for the Reserve

THE program instituted by the federal government to curtail the consumption of crude rubber so as to increase the United States stocks of this essential raw material as protection against a possible interruption of imports is of concern not only to the rubber industry, but also to the consuming public, which during this period will of necessity feel the effects of this restriction. In order that a minimum readjustment may be experienced it is essential that the rubber industry carefully consider the various means of accomplishing the objective and then formulate a broad program for adoption collectively by its members.

Future action must lead in one or both of two directions: either toward the maintenance of present quality with a reduced quantity, or toward the continuance of total unit production at a lower quality with its attending lessened serviceability per article to be attained by formula revision. The former alternative would insure the realization of accustomed per-unit service, but would result in a quantity scarcity, reduced employment by the rubber industry, and disruption of present manufacturing economy accompanied by a higher unit overhead expense. Conversely, the latter course would lower the standard of product perfection and performance, but it would retain the present status as to employment, manufacturing organization and efficiency, and the availability to civilian consumers of rubber articles which, although of lower quality, would for many uses perform a satisfactory service.

Because of the conditions accompanying competitive marketing, which is inherent in our system of merchandising, such a policy decision as to the future plan of action cannot be made separately by individual companies, but must be collectively reached and sponsored by all companies classified into each type-product group, after unbiased consideration has been given to non-industry as well as industry repercussions. If a plan of maintaining quantity production and reducing product quality is adopted, certain service standards would need to be set up and adhered to by the members of each sub-industry group.

From the viewpoint of the rubber manufacturer the maintenance of quality with reduced quantity appears to entail less organizational effort and lend itself to more speedy enactment. However when all phases of the problem are considered, the converse policy merits serious thought and may prove to be the better final solution.

The proper decision can best be reached after the federal government has indicated the probable duration and intensiveness of the proposed accumulation period by designating the number of tons of rubber now believed to constitute an ample reserve, and the time in which that goal should be accomplished. Best results can be accomplished if the procedure is planned from a long-range viewpoint. To date there has been no stipulation of a desired reserve beyond the 515,000 long tons provided for in the barter and other international agreements. However because of the higher consumption during recent months it now appears logical and quite possible that a much higher quantity should be specified. If any such action is contemplated by government agencies, announcement should be made soon so that a comprehensive program can be planned.

Regardless of the policy which is ultimately followed in reducing the consumption of crude rubber, the consuming public can do much to assist in providing desired service from rubber products by taking precautions to prolong the life of rubber goods. Rubber manufacturers have accomplished much through the use of antioxidants and other chemicals, but in many instances proper use of the rubber article is even more important.

Automobile tires constitute an outstanding example of the abuse which is often inflicted and also of the possibility for increased life through reasonable care. Reliable sources indicate that a tire 30% underinflated will give only 74% of the total mileage built into it. Underinflation not only accelerates tread wear, but it increases the hazard of bruising and shortens the life through greater heat build-up. At a speed of 70 miles per hour tread wear is reported to be twice as fast as at 45 miles per hour. The effects of inadequate attention to service conditions are indicated by statements that a tire one-half inch out of line will be dragged sideways 87 feet in every mile and that a wheel assembly one ounce out of balance at the tread will develop a 12-pound vibrating force when the tire is revolving at a speed of 60 miles per hour.

The opportunity for motorists to contribute to the conservation of crude rubber, promote the national defense program, and benefit themselves through economic practices, has been well stated by John L. Collyer, president of The B. F. Goodrich Co., in what he termed "rules of tire health" from which the following are taken:

1. Maintain recommended air pressures at all times.
2. Shift tires from wheel to wheel every 5,000 miles to insure even wear.
3. Don't take corners at high speed.
4. Don't slam on the brakes, except to avoid accidents.
5. Start up gently; do not spin the wheels and grind off rubber.
6. Don't drive too fast on hot, dry roads.
7. Don't bump into curbs.
8. Have the wheel alinement, front and rear, checked regularly.

S. C. Stillwagon

EDITOR

What the Rubber Chemists Are Doing

Rubber Division, A. C. S., Activities

Fall Meeting to Feature Symposium of Defense

A SYMPOSIUM of Defense, featuring four speakers, will be presented at the fall meeting of the Division of Rubber Chemistry, A. C. S., on Thursday afternoon, September 11, in "Temporary Room D," Convention Hall, Atlantic City, N. J. The names of the speakers and the titles of their papers follow: "Cooperation of the Rubber Industry with Defense", W. L. Finger, chief consultant, Rubber Unit, Office of Production Management, 2:00 p.m.; "The Present Status of Crude Rubber", E. G. Holt, United States Department of Commerce, 2:45 p.m.; "The Present Status of Synthetic Rubber", E. R. Bridgwater, E. I. du Pont de Nemours & Co., Inc., 3:15 p.m.; "The Present Status of Rubber Chemicals and Reclaimed Rubber", J. P. Coe, Naugatuck Chemical Division of United States Rubber Co., 3:45 p.m.

The banquet of the Rubber Division will take place September 11, after the Symposium, in the Ambassador Hotel. The Rubber Division will also convene September 12 to hear seven papers. Headquarters will be the Ritz-Carlton Hotel; while the three half-day technical sessions will be in Convention Hall.

Los Angeles Group Enjoys Annual Fishing Trip

ABOUT thirty fish were caught in the waters off Catalina Island by 48 members and guests of the Los Angeles Group, Rubber Division, A. C. S., who participated in the Group's sixth annual fishing trip on June 20 and 21. The fishing boat *Retreat* left San Pedro, Calif., at 4:00 p.m., June 20. In the evening the boat arrived at Avalon, Catalina Island, where all debarked and proceeded to John's Cafe where a fish dinner was served. Dancing at the Casino and sightseeing followed the dinner. The next day was spent entirely on the open seas, and the catch included, for both days, 25 barracuda, and "several" yellowtail.

Prizes were awarded as follows: *fish guessing contest,* L. Jung (U. S. Rubber), combination .22 rifle and 440 shot-gun [Mr. Jung won a repeating rifle in the same contest last year—Ed.]; *largest fish,* Eugene L. Hedrick (U. S. Rubber); *second largest fish,* L. G. Konig (McEldowney & Martin); *first sport fish,* R. M. LeRoy (B. F. Goodrich). Except for Mr. Jung's rifle and shot-gun combination, the prizes consisted of fishing rods and reels with lines. Twenty-nine additional prizes were drawn by lot.

The valuable prizes were made available through the donations of the following:

American Cyanamid & Chemical Corp., Arrowhead Lime & Chemical Co., Robert Badenhop Corp., L. H. Butcher Co., California Hardware Co., Cutler Hammer, Inc., Dill Mfg. Co., Marshall Dill, B. E. Dougherty Co., E. I. du Pont de Nemours & Co., Inc., C. P. Hall Co., J. M. Huber, Inc., Johnson Steel & Wire Co., Martin, Hoyt & Milne, Inc., McEldowney & Martin Co., H. Muehlstein & Co., Inc., National-Standard Co., H. M. Royal, Inc., Los Angeles, H. M. Royal, Inc., New York, San Francisco Sulphur Co., A. Schrader's Son, Inc., Western Insulated Wire Co., The Western Shade Cloth Co., Williams Clarke Co., Winne & Sutch.

Boston Group Enjoys Successful Outing

THE annual outing of the Boston Group, Rubber Division, A. C. S., was held July 18 at Weston Country Club, Weston, Mass., with a large attendance of 218 members and guests. The successful affair, arranged by outing co-chairmen H. A. Atwater (Hood Rubber) and F. B. Ward (Panco-Panther), featured a day of superb weather for the sports activities and culminated in an excellent dinner of steak or lobster in the evening.

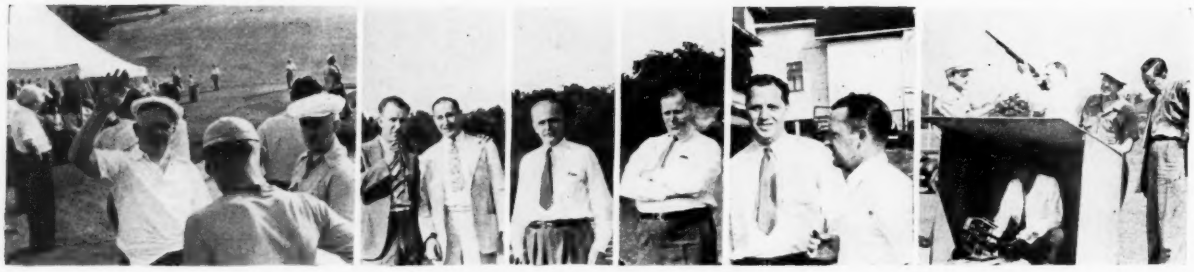
The golf winners follow: *kickers handicap,* J. G. Grower, M. Danovitch, A. L. Perry, R. B. Woodbury, and R. Patrick; *nearest to the pin,* G. Wilson, W. L. Brumby, and S. Coval; *low gross,* C. Round, E. B. Curtis, and C. Hamilton; *low net,* J. C. Walton, G. Greenbaum, and E. Varnum; *most 5's,* R. H. Sherman; *most 6's,* R. C. Kelley; *most 7's,* F. H. Langhorst; *most 8's,* J. L. Haas; *high gross,* C. Brown; *high net,* R. Breckenridge. The golf tournament was under the guidance of E. Colligan. In a soft ball game, "Jimmy" Geentry's Reading Bear Cats defeated "Larry" Shaw's Avon Tigers, 4—3. Winner of the horseshoe pitching contest was H. A. Hutchinson, and second winner was S. F. Butman; D. Wright handled this contest. The bowling tournament was won by L. Lurie, and second place went to P. Byrns. J. H. Clarke won first prize in the tennis singles and D. W. Kendall, second prize. A horse-race game was managed by R. E. Huber, and the darts game was under the supervision of W. Weller. The generosity of the following concerns made it possible for all those present to receive one of the excellent door prizes awarded.

L. Albert & Son, American Mineral Spirits Co. American Zinc Sales Co., Anaconda Sales Co., American Cyanamid & Chemical Corp., T. C. Ashley & Co., Atlantic Refining Co., S. L. Ayres & Co., Avon Sole Co., J. T. Baker Chemical Co. Barrett Co., Binney & Smith Co., Bird & Son, Brewer & Co., Boston Woven Hose & Rubber Co. Godfrey L. Cabot, Inc., Cambridge Rubber Co. D. R. Campbell Machine Co., Chemical & Pigment Co., Carter Bell Mfg. Co., Colonial Beacon Oil Co., C. F. Church Co., Cities Service Oil Co. Cleveland Liner Mfg. Co., Continental Carbon Co., Converse Rubber Co., Jas. B. Cunningham, Davidson Rubber Co., Dimond Union Stamp Co., Dicalite Co., E. I. du Pont de Nemours & Co., Inc., Eustice Pennock Co., Wm. D. Eggleston Co., Farrel-Birmingham Co., H. T. Feinberg & Sons, C. E. Gale & Co., General Atlas Carbon Co., General Electric Co., General Fiber Co., Genseke Bros., Ginsburg Bros., C. P. Hall Co., Harmon Color Works, Haartz Mason-Grower Co., Hird & Connor, Inc., Hood Rubber Co., Inc., J. M. Huber, Inc., Imperial Paper & Color Corp., Innis Speiden Co., Ernest Jacoby Co., Krebs Pigment & Color Co., D. H. Litter Co., Malrex Chemical Co., Merck & Co., Monsanto Chemical Co., H. Muehlstein & Co., National Vulcanized Fiber Co., Naugatuck Chemical Division of United States Rubber Co., Niagara Sprayer Co., North Shore Cutting Die Co., New Jersey Zinc Sales Co., Nurmberg Thermometer Co., Oakite Products Co., Panco-Panther Co., Philipp Bros., Inc., Plymouth Rubber Co., *The Rubber Age,* Sanford Mills, A. Schulman, Inc., Henry L. Scott Co., Scovill Mfg. Co., Simplex Wire & Cable Co., Shell Oil Co., Stanley Chemical Co., Stamford Rubber Supply Co., Standard Chemical Co., Stewart Bolling & Co., Inc., Stowe-Woodward Co., Inc., Sun Oil Co., Wm. R. Thropp & Sons Co., Titanium Pigment Corp., Tyer Rubber Co., Turner Halsey Co., United Carbon Co., R. T. Vanderbilt Co., Vultex Chemical Co., Wamsutta Mills, Weller Chemical Co., L. G. Wittemore, Inc., Chas. T. Wilson Co., Wishnick-Tumpeer, Inc., Warwick Chemical Co., and Xylos Rubber Co.

The next meeting of the Boston Group will be held at the University Club, Boston, Mass., Friday, October 3.

The New York Group, Rubber Division, A. C. S., has announced that all papers to be submitted for its 1941 Prize Essay Contest must be in the hands of the committee by September 4.

Taken at the Boston Outing by George W. Smith



Photographed at the Akron Outing

Akron Group Outing Has Record Attendance

With a day of perfect weather, the Akron Group, Rubber Division, A. C. S., held its annual outing at Silver Lake Country Club, Akron, O., June 20. A record attendance turned out to play golf or take part in other activities. At the dinner in the evening, which 474 members and guests attended, 148 prizes, available through the generosity of donating companies, were distributed.

V. K. Hitch (Akron Chemical) and E. H. Nahm (Naugatuck Chemical) were general chairman and vice chairman, respectively, and T. L. Stevens (C. P. Hall) had charge of the prize solicitation. Committees were as follows: *prize awards:* C. B. Moore (Philadelphia Rubber Works), chairman, L. V. Cooper (Firestone), R. H. Seeds (Goodyear), H. L. Dixon (Philadelphia Rubber); *finance and tickets:* D. G. Benson (Goodrich), chairman, J. L. Vosberg (Firestone), A. F. Schmidt (Goodyear); *golf:* J. B. Waite (Dugan Campbell), chairman, L. Baker (Firestone); *afternoon refreshments:* F. A. Bonstedt (Binney & Smith); *tomfoolery:* C. F. Marshall (C. F. Marshall & Co.), chairman, W. P. Voth (Akron Standard Mold), W. Whitaker (Herron & Meyer), *publicity:* A. E. Warner (C. P. Hall).

The contributors of prizes included:

Adamson Machine Co., Akron Chemical Co., Akron Standard Mold Co., Akron Paint & Varnish Co., L. Albert & Son, American Cyanamid & Chemical Corp., American Mineral Spirits Co., American Zinc Sales Co., Anaconda Sales Co., J. T. Baker Chemical Co., Barnsdall Oil Co., Barrett Co., Binney & Smith Co., Barium Reduction Corp., Bridgeport Brass Co., Godfrey L. Cabot, Inc., Cannon Mills, Inc., Carbide & Chemical Corp., Carter Bell Mfg. Co., Central Rubber Corp., E. W. Colledge, Inc., G.S.A., Continental Rubber Co. of New York, Dill Mfg. Co., Dow Chemical Co., E. I. du Pont de Nemours & Co., Inc., Eastern Magnesia Talc Co., Inc., English-Richmond Mica Corp., Erie Railroad, Farrel-Birmingham Co., Inc., Factory Tool & Supply, Forbes Varnish Co., John Gammeter, General Magnesite & Magnesia Co., General Atlas Carbon Co., General Latex & Chemical Co., Geometric Stamping Co., Goodrich Silvertown Stores, C. P. Hall Co., Bancroft W. Henderson & Co., Herron & Meyer, J. M. Huber, Inc., Hydrocarbon Chemical & Rubber Co., International Pulp Co., Mrs. Johnson (A. Polsky Co.), Charles E. Johnson, F. Lester Kittle, Inc., Manufacturers Rubber & Supply Co., Midwest Rubber Co., Monsanto Chemical Co., H. Muehlstein & Co., Inc., F. E. Myers & Bros., National Rubber Machinery Co., National-Standard Co., Naugatuck Chemical Division of United States Rubber Co., New Jersey Zinc Co., Niagara Sprayer & Chemical Co., Norris Mfg. Co., Ohio Mineral Spirits, Ohio Rubber Co., Ozark Smelting & Mining Co., Pequanoc Rubber Co., Inc., Philadelphia Rubber Works Co., Pittsburgh Plate Glass Co., *Rubber Age*, Russell Farley & Co., Russell Harp, A. Schrader's Son, Inc., Shell Oil Co., Southeastern Clay Co., Southern Acid & Sulphur Co., Stamford Rubber Supply Co., Stanco Distributors, Inc., Standard Oil Co., Stauffer Chemical Co., Hugh S. Stoller, Sun Oil Co., Superior Zinc Co., Synthetic Products, Inc., Thiokol Corp., Thompson-Weinman & Co., Titanium Pigment Corp., Turner Halsey Co., R. T. Vanderbilt Co., Inc., Charles T. Wilson Co., Wishnick-Tumpeer, Inc., and Xylos Rubber Co.

A.S.T.M. Annual Meeting

THE 1941 annual meeting of the American Society for Testing Materials, held in Chicago, Ill., June 23 to 27, had a registered attendance of 1,553, the greatest in the Society's history. G. E. F. Lundell, of National Bureau of Standards, succeeded W. M. Barr, of Union Pacific Railroad Co., as president of the Society. Arthur W. Carpenter, manager of the testing laboratories of The B. F. Goodrich Co., was elected a member of the A.S.T.M. executive committee for a two-year term. The 1942 meeting of the Society will be held in Atlantic City, N. J., June 22 to 26.

Edgar Marburg Lecture

"Natural and Synthetic Rubbers" was the title of the Edgar Marburg Lecture delivered by Harry L. Fisher, director of organic research, United States Industrial Chemicals, Inc., Stamford, Conn. The chemistry, physics, and methods of compounding synthetic rubbers were briefly discussed and compared with those of natural rubber. After pointing out how the vulcanizates of the synthetic rubbers resemble and excel those of natural rubber, Dr. Fisher emphasized that vulcanized natural rubber is superior to all synthetics now available in elasticity and rebound, low energy loss and low heat generation through hysteresis, extensibility, and resistance to stiffening at low temperatures. If the sources of rubber supply are shut off by the war, the result will be amplified applications of the synthetic rubbers, Dr. Fisher concluded, and after the war is over the synthetic rubbers will probably continue in many new uses, even if the natural product is less costly.

Committee on Rubber Products

The report of Committee D-11 on Rubber Products, submitted by O. M. Hayden, chairman, included three proposed tentative standards. One of these was developed by Technical Committee A on Automotive Rubber, joint S.A.E. and A.S.T.M. committee: testing automotive air brake and vacuum brake hose. The testing requirements for air brake and vacuum brake hose are substantially equivalent to those for hydraulic brake hose, which were approved last year. The hydraulic brake hose testing requirements cover: volumetric expansion under pressure, bursting strength, fatigue life, and tensile strength.

The two other proposed standards cover tests for tear resistance of vulcanized rubber and for compression fatigue of vulcanized rubber. The first of these employs a procedure used for the usual grades of soft vulcanized rubber such as tire tread, carcass, and inner tube compounds, or those used in most mechanical rubber goods. The rubber specimen, stamped out in a steel die, is cut with a single slit at a prescribed point and placed in a power-driven apparatus with one moving jaw. The resistance to tear is the ratio of maximum load to average thickness of the specimen.

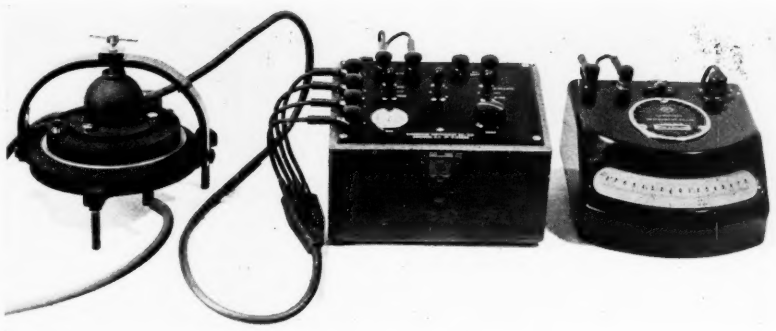
The test for compression fatigue of vulcanized rubber may be used for comparing the rate of heat generation and the fatigue characteristics of vulcanized rubber compounds. The method requires the use of either the Goodrich flexometer, the Firestone flexometer, or the St. Joe flexometer, and yields comparative data which are particularly useful in research and development and which may be used as a basis for judging service quality.

Eight tentative standards are to be referred to the Society ballot for adoption as standard: testing flat rubber belting (D378-40T); testing for indentation of rubber by means of the Pusey & Jones plastometer (D531-39T); testing rubber insulated wire and cable (D470-40T); tension testing of vulcanized rubber (D412-40T); specifications for insulated wire and cable, class AO, 30% *Hevea* rubber compound (D27-40T); specifications for insulated wire and cable, performance rubber compound (D353-40T); specifications for insulated wire and cable, heat-resisting rubber compound (D469-40T); and specifications for rubber sheath compound for electrical insulated cords and cables. (D532-39T).

William C. Geer, formerly vice president in charge of research and development, B. F. Goodrich Co., and W. Burton Wescott, consulting chemist, Dover, Mass., in a technical paper discussed a method for the testing of adhesive tape. Certain precise manipulative methods were developed in the determination of the adhesion between the surface of the adhesive and that to which it is fastened. A linear constant-speed rolling device which applied strips of tape to any thin flat surface under uniform conditions of time and pressure was described. It was concluded from the tests that each adhesive gives a curve characteristic of its composition when tested

(*Continued on page* 84)

New Machines and Appliances



Cambridge Fabric Permeameter

Cambridge Permeameter Measures Diffusion Rates through Fabrics

THE measurement of the permeation of gases through fabrics which have been treated with rubber or rubber-like materials is accomplished by the Cambridge fabric permeameter, which consists of test plates, control box, and galvanometer. The instrument utilizes the thermal conductivity principle of operation and indicates permeation rates in liters of retained gas permeated per square meter of fabric per 24 hours. It is said that the instrument is applicable to the testing of fabrics used in the manufacture of lighter-than-air craft, life rafts, life jackets, gas masks, etc.

Hydrogen, or other test gas, is admitted to the lower chamber of the test plates, and it immediately begins to diffuse through the prepared fabric, which is clamped between a pair of test plates, into the upper chamber where a platinum spiral is located. The spiral is connected to a Wheatstone bridge in the control box. When the hydrogen mixes with the air in the upper chamber, a change in thermal conductivity is produced, causing a corresponding change in the temperature of the platinum spiral. This temperature change, unbalancing the Wheatstone bridge, is registered by a galvanometer which progressively responds to the increasing concentration of the hydrogen as the test proceeds.

If two readings are taken, one at a definite time after the other, they will determine the slope of the time concentration curve. Multiplying this by a factor which has been previously determined in the calibration of the instrument converts the slope directly into terms of permeability. Cambridge Instrument Co., Inc., 3732 Grand Central Terminal, New York, N. Y.

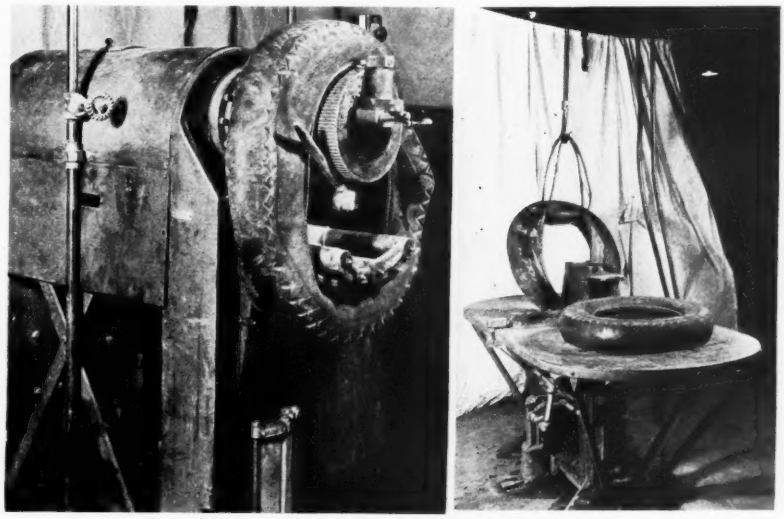
Black Rock Debeader[1] Conserves Scrap Rubber

TIRE debeading equipment, which comprises two machines, one a cutter and the other a bead puller, is claimed to effect a saving of approximately 60% of bead section scrap, generally all discarded when conventional tire debeading methods are employed. It is reported that from 20 to 34 million pounds of scrap rubber (on the basis of 1940 figures) could be saved annually by the use of the new equipment. The new method also requires slightly less time than conventional methods, the manufacturer claims. In the process, the tire is cut through the rubber and fabric to (but not through) the bead wires, after which the wires are pulled out of the circumferential cuts. Thus the entire bead section with the exception of the wire is retained for reclaiming. Any hard rubber, which might interfere with reclaiming, is said to adhere to the bead wire upon removal.

The cutting machine consists of a cutting head with two rotating corrugated members driven by a three h.p. motor; two tungsten steel knives, operated by pneumatic cylinders through a foot pedal; a tensioning device, also actuated by a pneumatic cylinder. The bead puller, made to accommodate two tires, is essentially a flat table, with two clamping devices operated by pneumatic cylinders. Two knife-pointed cutting hooks, one for each side of the table, are operated by a three h.p. reversing motor on the chain hoist principle. The hook operating device is mounted on a column (not shown in the photograph) that rises from the center of the table. Machines are of structural iron and steel castings with heat-treated alloy steel working members and bronze bearings.

The tire to be debeaded is placed over the cutting head, and the tensioning member is brought into cutting contact with the tire upon depression of one of the two foot pedals. In this position the tire simulates a belt drive arrangement. The starting switch is thrown to rotate the driving member of the head, and the two knives are brought into cutting contact with the bead sections of the tire by depressing the second foot pedal. After one revolution of the tire, during which the rubber and the fabric are cut through to the bead only, the tire is automatically released. Placed horizontally on the table of the bead cutter, the tire is clamped so that the both sidewalls are brought firmly together near the beads. The hook is placed under the bead sections, and the hoist motor is placed in action so that the hook moves upward with the sharp knife point cutting through rubber and fabric. Both beads are hooked and pulled out of the tire in the operation.

In one plant the two machines are reported to have been in successful operation for the period of one year. Black Rock Mfg. Co., Bridgeport, Conn.



Black Rock Debeading Equipment

Cutting Machine Showing Tire Near the End of One Revolution — Bead Puller in Bead Removal Operation

[1] Licensed by B. F. Goodrich Co., Akron, O., under U. S. patent No. 2,230,302.

New Goods and Specialties

Converse Sportlite

Lightweight Rubber Boot

WEIGHING only two pounds 12 ounces, or less than half the weight of an ordinary rubber boot, the Sportlite boot for hunters, fishermen, and other sportsmen may be pulled over leather or sheepskin shoes. To permit the boot to slide easily over regular shoes, a special unit construction inner back is used. When rolled up, the boots form a small compact bundle. Olive drab in color, the Sportlite is made in both sporting and knee lengths. Converse Rubber Co.

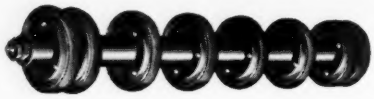
Nonslip Rubberpull for Belt Pulleys

INCREASES up to 50% in the efficiency of belt drives are claimed for Nonslip Rubberpull, a liquid with a rubber cement base. The material, which can be applied easily by brush to the face of any pulley, flat or V-type, dries overnight to provide a coating with a high coefficient of friction. Nonslip Pulley Covering Co.

Two Rubber-Tread Idlers

TWO rubber-tread idlers, one a return idler and the other a troughing idler, for use with belt conveyers, provide the cushioning effect of rubber-to-rubber contact between rubber belt and idler, which is said to minimize abrasive wear on the belt as well as protect the bearings and framework from shock. The return idlers, for belt conveyers from 14 to 60 inches wide, comprise from four to twelve six-inch diameter rubber-tired rolls spaced and fitted on a roller-bearing-equipped steel tube. The rubber

Homocord Conveyer Belt



Rubber-Tread Return Idler

tires in the return idler are made split from extruded stock and are clamped between two steel disks bound together by three bolts.

The troughing idlers, made for the same belt widths, consist of molded six-inch diameter rolls which are secured to a tube equipped roller with roller bearings by set screws through malleable iron spacers clamped over reenforced rubber hubs. Link-Belt Co.

Ink Pad with Sponge Rubber Filler

THE Thomas Lifetime ink pad features a sponge rubber filler with over 140 inverted conical cuts in the surface, each of which acts as a separate ink well. Each of these tiny ink wells has its own individual cap which prevents evaporation and the entry of foreign matter into the ink; the wells automatically release ink when the rubber stamp is pressed upon the pad. The filler is cemented in a solid rubber base, and the pad is provided with a bakelite top. It may be used with opaque inks having a creosote base, and the rubber is said to be compounded so that it is impervious to any ink acid. It is claimed that this new pad will not become hard and dry, will not throw off lint, and will save wear and tear upon the stamps. The size of the ink pad is three by 4⅝-inches. Thomas Mfg. & Sales Co.

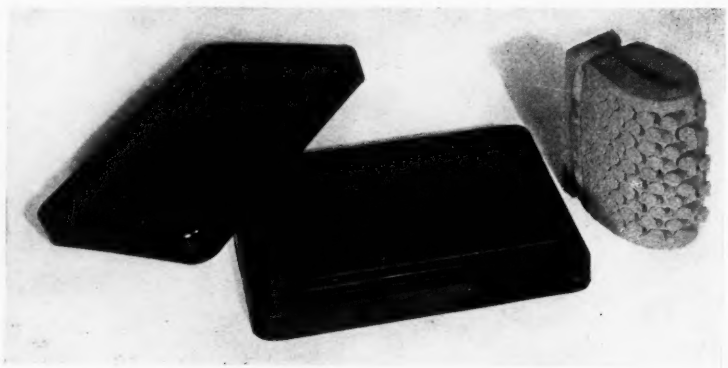
Cord Conveyer Belt Holds Metal Fasteners

THE Homocord conveyer belt uses a special type of cord and a new principle of body construction which were developed to meet the particular requirements of conveyer belts, but which are unsuited for other rubber products such as transmission belts or tires, according to the manufacturer. Claims made for the belt include the correct proportioning of lengthwise and crosswise strength and flexibility, low inelastic stretch, resistance to fatigue and impact, and equal life in body and cover. The new construction is said to combine the flexibility of cord with the ability to hold metal fasteners. Raybestos-Manhattan, Inc.

Cushion Tire for Small Tractors

DESIGNED for small industrial tractors, the Innacush tire is built with an undertread cushion of resilient rubber which gives the tire shock absorption qualities. The design of the tread, said to add to the cushioning qualities, is non-skid with gripping ability on wet and oily floors and on ramps and runways. These qualities are claimed to lengthen the life of the tractor and increase the comfort of the operator since the average small industrial tractor has no springs. Innacush is made in the 21x5x15-inch size. United States Rubber Co., New York, N. Y.

View of Section of Innacush Tractor Tire



Thomas Lifetime Ink Pad: *(Left)* Complete Unit; *(Right)* Sponge Filler Folded to Show Inverted Conical Cuts

UNITED STATES

Industry at Record High

Since June industry has been advancing at the highest levels in history, and the usual summer decline has not taken place this year. Output, estimated at least 20% greater than the 1937 peak, is expected to be so maintained well into 1942. Some fields, however, are being checked against even further expansion by the difficulty of securing supplies, especially for non-defense goods. Besides additional manufacturing facilities are needed.

Every effort is being expended to expedite military preparations by fully utilizing available facilities and using machines 24 hours a day, seven days a week. It is also planned to enlist every factory possible for the making or assembly of military supplies and equipment; consequently defense orders are increasingly being farmed out to subcontractors.

Except for minor fluctuations and the let-down due to the holiday week-ends and, of course, labor trouble, most industries have been operating at or near capacity. Carloadings have been the heaviest since 1930, and the freight-car total is being raised 16%. Sales of electrical appliances for the first quarter this year rose 50.4% above those of the corresponding period last year. Wool goods activity is the highest on record; while bookings assure the present rate well into the third quarter; and cotton mills reported many plants on a three-shift basis. The construction industry, moreover, is enjoying a boom under the impetus of plant expansion and defense housing. Purchases of shoes were said to be the best in years, although the trade feels these sales are partly due to anticipating buying and inventory building. If the present rate of footwear production continues, it is believed output for 1941 will exceed 450,000,000 pairs, or more than the combined total of European countries in 1939, when the United States made 424,000,000 pairs. Production for the first half of 1941 is estimated to be the record of 241,683,000 pairs, against 196,259,000 pairs in the same months of 1940. Passenger-car and truck production for the 1941 model year, set at about 5,200,000 units, was the highest since 1929. Retail sales are reported excellent, with buyers anticipating price advances and government requirements increasing; and dealers' stocks of new cars are estimated to be less than a year ago. High output ran until the change-over for new models the beginning of August, when production was curtailed 20% under government decree. On July 19 a tentative program was announced by Leon Henderson, OPACS administrator, cutting automobile output, excluding trucks of more than one-ton capacity, to 50% of the comparable 1940 period, to begin November 1.

Small Concerns Exempted in August Consumption Cut

On July 28 telegrams were sent to rubber manufacturers by the Priorities Division, OPM, stipulating the amount of rubber each processor would be permitted to use during August. Small rubber processors, aggregating nearly 247 companies, each of which consumed less than 10 tons of rubber a month during the 12-months base period of General Preference Order No. M-15 (April 1, 1940 to March 31, 1941) will not be required to cut consumption during August, with the provision that not more than 10 tons be used in that month. In the case of about 86 other concerns, most of whom are engaged in defense production, special concessions were made for August. Large processors, numbering approximately 144 concerns and representing 90% of total consumption, were informed that no changes were made in their cases, and that they must adhere to the original terms of M-15, which limits August consumption of 94% of the base period use. It might be noted that the August restriction represents a cut of 37% from June consumption, as contrasted with the 20% cut below June imposed during July.

June Rubber Consumption

Crude rubber consumption in the United States, as reported by The Rubber Manufacturers Association, Inc., jumped sharply during June to 84,912 long tons, an all-time record high, from 71,365 tons in May and 71,374 tons in April. As it was generally believed that the rubber industry was operating at near-capacity levels during April and May, the June increase might be construed as being somewhat artificially high. It will be recalled that General Preference Order No. M-15 was amended on June 27 by Supplementary Order No. M-15-a which provided that no rubber processor would be required to reduce his rubber consumption during July by more than 20% of his June figure. Naturally all manufacturers made every effort to consume up to the absolute limit during June, and without doubt a fairly large amount of rubber entering into consumption during June, (and therefore reported as rubber consumed) did not reach the final processing stage during that month. Assuming that all manufacturers consumed the full allotted amount during July, industry consumption for that month would be 67,930 long tons.

In connection with the current government program in building up crude rubber stocks, it is reported that a two-year supply of rubber has been set as a goal by the OPM although no definite announcement has been made to that effect.

CALENDAR

Sept. 8-12. A.C.S. 102d Meeting. Atlantic City, N. J.

Sept. 25-26. S.A.E. National Tractor Meeting. Schroeder Hotel, Milwaukee, Wis.

Oct. 3. Boston Rubber Group. University Club.

Oct. 11-14. N.A.W.M.D. Fall Convention. San Francisco, Calif.

Oct. 12-15. A.S.M.E. Fall Meeting. Louisville, Ky.

Oct. 17. New York Rubber Group. Building Employers' Trade Assn.

Dec. 1-6. 18th Exposition of Chemical Industries. Grand Central Palace, New York, N. Y.

Tire and Tube Prices Advanced

As we go to press, it is learned that leading tire and tube manufacturers advanced list prices of tires and tubes 2.4%, effective July 30. New lists will show the federal excise tax separately, permitting the inclusion later of the higher tax provided in pending legislation, without issuing new lists. It was reported that the OPACS allowed a price adjustment provided that it did not raise wholesale prices more than 5%.

Certificates of Necessity Issued

Office of Government Reports, Washington, D. C., (in collaboration with the National Defense Advisory Commission) included in its recent listings of Certificates of Necessity for plant expansion the following: Anaconda Wire & Cable Co., facilities for asbestos shipboard cable, at an estimated cost of $22,000; Carborundum Co., Niagara Falls, N. Y., silicon carbide, vitrified, abrasive wheels and products, $1,414,000; Collyer Insulated Wire Co., Pawtucket, R. I., shipboard cable, $99,000; Goodyear Aircraft Corp., Akron, O., non-rigid airships and tail surfaces for airplanes, $165,000; Hood Rubber Co., Inc., Watertown, Mass., battery jars, containers, and covers, $16,000; Plant Rubber & Asbestos Works, San Francisco, Calif., magnesia pipe covering and blocks, $345,000; United States Rubber Co., New York, bullet-sealing tube equipment, cable grinding wheels, tires, and plant protection, $111,000; Acushnet Process Co., New Bedford, Mass., faceblanks, $59,000; E. I. du Pont de Nemours & Co., Inc., Wilmington, Del., chemicals, $26,000; General Cable Corp., New York, cable, $197,000; National Electric Products Corp., Pittsburgh, Pa., cable, $115,000; New Jersey Zinc Co., New York, slab zinc, $450,000.

Certification enables manufacturers to avail themselves of the 60-month tax amortization plan. Certification, however, does not mean that such expansion will necessarily occur.

Price Ceiling Deferred on Rubber Products

Contrary to reports current in June that a price ceiling at June 16 levels was imminent on tires and tubes, Leon Henderson, administrator, Office of Price Administration and Civilian Supply, Washington, D. C., on July 3 stated that establishing ceiling prices on finished rubber products, especially tires and tubes, will be postponed several months, and the industry will have a chance to work out the current price problem on a voluntary basis. This decision followed a conference with tire manufacturers, mass distributers, and dealers at which industry representatives stated that despite curtailed rubber consumption prices of tires and tubes would not rise unjustly. They are already low because of keen competition. It is also expected that reduced automobile production will limit demand. The industry fully believes that except for minor increases due to higher materials costs prices will continue at present levels.

Manufacturers and major distributers have been requested to consult with the OPACS prior to making changes in list prices and in discounts therefrom. Such action will not be necessary in the case of minor adjustments in retail prices confined to a small number of local markets.

The above move by Administrator Henderson should indicate to civilian buyers that adequate supplies of rubber products are available at fair prices. The OPACS through its Consumer Division is also urging the general public to take better care of cars and tires. Recommended for longer tire life are driving at moderate speeds, proper tire inflation poundage, proper wheel alinement, and the avoidance of holes and rubble while driving. More detailed information on the care of automobiles and tires appears in the June 30 issue of *Consumer Prices*, obtainable from the Consumer Division of OPACS.

Ben W. Lewis, professor of economics at Oberlin College, has been named price executive in charge of the OPACS rubber and rubber products section.

Supply Contracts Awarded

Among recent listings of supply contracts awarded by various departments of the United States Government were:

NAVY: *battery, storage, testing outfits and parts,* Electric Storage Battery Co., $32,200; *brushes, paint,* Rubberset Co., $21,125; *cable,* General Electric Co., $9,725, John A. Roebling's Sons Co., $36,875, Rome Cable Corp., $27,635; *chamois skins,* Atlantic Sponge & Rubber Co., $9,819; *erasers, etc.,* Charles G. Stott & Co., Inc., $18,128; *fabrics,* Mt. Vernon Woodberry Mills, Inc., 792,500; *flint aluminum oxide sheet and paper abrasive cloth,* Minnesota Mining & Mfg. Co., $18,714; gaskets, United States Rubber Co., $5,241; *goggles,* Olympic Co., $10,175; *hose,* Boston Woven Hose & Rubber Co., $16,830, Pioneer Rubber Mills, $10,500; *pencils,* Joseph Dixon Crucible Co., $46,947; *thermometers,* Taylor Instrument Cos., $14,060; *webbing,* Russell Mfg. Co., $17,250.

WAR: *ammonium nitrate,* Barrett Co., $541,875; *assemblies, bushing,* Goodyear Tire & Rubber Co., Inc., $1,236.44; Schacht Rubber Co., Inc., $1,065.15; *assemblies, track,* Firestone Tire & Rubber Co., $844,761; *assembling canisters,* Goodyear, $105,400; *bags, pliofilm,* Shellmar Products Co., $71,250; *battery assemblies,* Electric Storage, $502,150; *bearings,* Timken Roller Bearing Co., $11,475.70; *belts, pistol,* Russell, $24,360; *blankets,* U. S. Rubber, $6,060; *booth, complete nozzle-type wash,* DeVilbiss Co., $1,003.50; *cable,* American Steel & Wire Co., $51,331, Anaconda Wire & Cable Co., $367,790, Collyer Insulated Wire Co., $362,518, Crescent Insulated Wire & Cable Co., Inc., $147,283, National Electric Products Corp, $714, Phelps Dodge Copper Products Co., $353,847, Roebling, $6,405, Simplex Wire & Cable Co., $10,033.50; *cable with reels,* Circle Wire & Cable Corp., $76,044.50, General Cable Corp., $6,183; *chemicals,* Monsanto Chemical Co., $150,000; *cotton duck,* Mt. Vernon Woodberry, $81,364.50, U. S. Rubber, $337,500; *cotton duck, tent,* Turner Halsey Co., $283,420; *coats, firemen's,* U. S. Rubber, $16,978.50; *cushions,* Miller Rubber Co., Inc., $2,156; *cushions and blankets,* Hodgman Rubber Co., $6,785; *disks,* B. F. Goodrich Co., $4,590, Tyer Rubber Co., $4,590; *enamel,* Pittsburgh Plate Glass Co., $13,200; *faceblanks,* Acushnet Process Co., $139,000, Firestone, $132,500, General Tire & Rubber Co., $139,000, Goodyear, $93,000; *fatigue testing machines,* Baldwin Locomotive Works, $1,590; *fenders,* General Motors Corp., $2,222; *flaps, fender,* Crown Products Co., $1,028.60; *flint paper,* Minnesota Mining, $2,077.11; *floats,* Goodyear, $2,795; *footwear,* Cambridge Rubber Co., $132,853.88, Goodyear Footwear Corp., $7,490, Goodyear Rubber Co., $12,339.36, Hood Rubber Co., Inc., $184,587.87, La Crosse Rubber Mills Co., $108,803.40, Mishawaka Rubber & Woolen Mfg. Co., $90, U. S. Rubber, $322,928.04; *forgings,* United Shoe Machinery Corp., $7,946.30; *gasoline and oil,* Socony-Vacuum Oil Co., Inc., $161,773.20; *gloves,* Surety Rubber Co., $10,690.98. Miller Products Co., $937.20; *grinders,* Bay State Abrasive Products Co., $1,025.50, Norton Co., $75,338.53; *hats,* U. S. Rubber, $14,780; *hose,* Goodyear $54,888.42; *hose and wrenches,* Boston Woven Hose, $11,354.84, Mercer Rubber Co., $8,219.85; *hose tubes,* Acushnet, $216,000, Goodyear, $216,000, U. S. Rubber, $285,840; *inner tubes,* Falls Rubber Co., $2,017.05, General Tire, $23,611.80; *joint filler,* Charles S. Harper, $1,029; *joints, gun packet expansion,* Yarnall-Waring Co., $1,861; *links,* Firestone, $1,649.38; *links, metallic,* Firestone Steel Products Co., $10,293,675; *machine tools and equipment for small arms ammunition plants,* Black Rock Mfg. Co., $192,450, E. I. du Pont de Nemours & Co., Inc., $64,517; *masks, gas,* Johnson & Johnson, $83,300; *matting, Goodyear,* $44,400, U. S. Rubber, $68,102.50; *mouthpieces,* Continental Rubber Works, $6,897; *oxygen cylinders,* Firestone Steel, $850,000; *packing, metallic asbestos cloth and reenforce for gaskets,* Garlock Packing Co., $6,685; *patches, facepiece,* Plymouth Rubber Co., $6,500; *pigment, dry,* National Lead Co., $6,462; *plaster, adhesive,* Seamless Rubber Co., $11,248.82; *presses, tire,* Rodgers Hydraulic, Inc., $10,585; *pumps, tire,* Ajax Auto Parts Co., $2,175; *rafts,* Goodyear, $1,729,065; *raincoat,* Cable Raincoat Co., $1,180,049.88, Chicago Rubber Clothing Co., $105,470, A. B. Zuckert Co., $102,982.50; *socks,* Mishawaka, $18,810; *soda lime,* Dewey & Almy Chemical Co., $18,000; *spreaders, tire,* Kehawke Mfg. Co., $1,351.50; *sprinklers, powder,* American Hard Rubber Co., $1,400; *stoppers,* Faultless Rubber Co., $4,080; *sulphate of alumina,* American Cyanamid & Chemical Corp., $3,870; *surgical supplies,* Mercer Glass Works, Inc., $2,307.50, Seamless, $32,907.53, Tyer, $3,376.42; *tanks, developing,* American Hard Rubber, $4,800; *tape,* Coated Products, Inc., $14,211.26, Industrial Tape Corp., $39,170, Kendall Co., $16,029.38, Minnesota Mining, $112,007, Peerless Adhesive Products Co., $8,600; *testing machines,* Henry L. Scott Co., $1,152; *tires,* Falls, $68,299.74, Firestone, $72,513.70, General Tire, $123,775, Goodrich, $43,788.15, Seiberling Rubber Co., $11,040, *tires and tubes,* Firestone, $153,510.25, Falls, $4,495, Goodrich, $7,874, Lee Tire & Rubber Co., $30,363.16; *tools and parts,* Ohio Rubber Co., $1,275; *tools, grinding,* Bay State $1,667.82; *tracks, Goodyear,* $5,357.76, U. S. Rubber, $10,929.84; *trucks, electric, and tires,* Goodyear, $1,556; *tubes, air containers,* Goodyear, $5,200; *tubing,* Quaker Rubber Corp., $935.75; *valves,* Goodrich, $7,800, Goodyear, $29,000, O'Sullivan Rubber Co., Inc., $117,120; *webbing,* Everlastik, Inc., $57,400, Moore Fabric Co., $19,200, Russell, $87,692.80, United Elastic Corp., $85,656.11; *wheels, (tires, tubes, and beadlocks),* Firestone, $2,928.68; *wire,* Acorn Insulated Wire Co., Inc., $34,800, General Cable, $2,916,703.62, Okonite Co., $2,100, Roebling, $12,317.21, Simplex, $7,072.50; *wire with reels,* General Cable, $659,890, Whitney Blake Co., $241,175.

OPM Announcements

Office of Production Management, Division of Priorities, Washington D. C., has created a Compliance Section to investigate and take proper action in cases involving non-compliance or violation of priority orders. When efforts to obtain voluntary cooperation fail, punitive action may include: (1) publicity; (2) withholding of supplies of critical materials; (3) court action, L. J. Martin is head of this new section.

Albert M. Creighton, director of the Boston Woven Hose & Rubber Co., Cambridge, Mass., has been appointed district coordinator of the Defense Contract Service, OPM, for the Boston area.

Mr. Stettinius has also appointed Harry L. Bailey, president, Wellington Sears Co., 65 Worth St., New York, as producers' representative on the Textile Priority Committee.

Simplification Program Imminent

On July 15, Donald M. Nelson, OPM director of purchases, announced that the Government, in the interests of national defense, will soon launch a broad program simplifying the lines and varieties of goods offered to the consuming public. Each industry will have a committee composed of representatives of manufacturers, distributers, and consumers selected by the Government from nominations by the industry. Decisions will be made by the Government after full discussion with each industry's committee.

New Commodity Branches

E. R. Stettinius on July 17 announced the creation of eight Commodity Branches to deal with problems relating to certain materials and classes of materials in which importation or allocation problems are paramount. Creation of these branches is in accordance with the recent realinement of responsibility within the OPM, involving the setting up of both Commodity Branches and Industry Advisory Committees. Each branch has a chief in charge of all matters considered by the branch, whether priorities, production, or purchases.

Mr. Stettinius has supervision over the activities carried on in these branches, and the deputy director is Philip D. Reed, senior consultant for the Priorities Division. The Commodity Branches headed by Mr. Stettinius form one industrial sub-division of the several within the OPM.

Section 1, of which Harry S. Rogers is chief, covers rubber synthetic rubber, and cork. W. F. Finger, formerly of the R.M.A. as chairman of the tire and the footwear divisions, is now rubber consultant assisting Dr. Rogers. John A. Church is chief of Section 4, which includes zinc. Titanium and rutile and their alloys are listed in Section 5, with Andrew Leith as chief.

A consultant on stock-piling will soon be named.

Rubber Industry Advisory Committee

The OPM has also created the Rubber Industry Advisory Committee to aid in placing crude rubber supplies on a priority basis. The Committee consists of: A. L. Viles, president of The Rubber Manufacturers Association, Inc., acting chairman; R. E. Bloch, president, Mohawk Rubber Co.; A. L. Freedlander, Dayton Rubber Mfg. Co.; A. A Garthwaite, president, Lee Rubber & Tire Corp.; F. C. Jones, president, Okonite Co.; F. Thatcher Lane, president, Seamless Rubber Co., Inc.; Paul W. Litchfield, chairman, Goodyear Tire & Rubber Co.; Harry E. Smith, sales manager, Manhattan Rubber Mfg. Division of Raybestos-Manhattan, Inc.; Herbert E. Smith, vice president, United States Rubber Co.; John W. Thomas, president, Firestone Tire & Rubber Co.

Nearpara Rubber Co., continues to operate to capacity reclaiming rubber. President Benjamin M. Rosenthal vacationed along the New England Coast.

40c Wage Set for the Rubber Industry

Philip B. Fleming, administrator of the Wage and Hour Division of the United States Department of Labor, Washington, D. C., on June 30 issued a wage order, effective July 28, 1941, establishing a 40¢ minimum hourly rate for the rubber industry, as recommended unanimously by a committee representing the public, employers, and employes.[1] This rate is said to increase the wages of 9,900 of an approximate 132,000 workers in about 600 plants.

The rubber products manufacturing industry is defined as: the manufacture of all products having as an ingredient any form of natural rubber (including latex), reclaimed, scrap, compounded, or synthetic rubber, rubber derivatives, balata, or gutta percha, including parts for use in other goods, and footwear made by vulcanizing the entire article or the sole to the upper; the manufacture of reclaimed rubber; and the preparation of scrap rubber for use in the manufacture of reclaim or rubber products. Abrasive wheels, brake linings, and insulated wire and cable are not included, as well as any product the manufacture of which is covered by an administrative order defining an industry and approving the recommendations of an industry committee or appointing such a committee, issued prior to the signing of Administrative Order No. 85 appointing Industry Committee No. 22 for the Rubber Products Manufacturing Industry. The "preparation" of scrap rubber does not include the mere collection and handling of scrap rubber by waste material dealers who perform no operations changing the shape or form of such scrap.

Covered in the order are all occupations necessary to the production of products, including clerical, maintenance, shipping, and selling, but not such functions when conducted in a wholesale or selling department physically segregated from other departments of the establishment, or when the greater part of the establishment's sales are of products not covered by the rubber industry definition.

When an employe works at two or more different rates of pay during the same workweek, he must receive the highest rate unless records concerning his employment are kept in accordance with regulations on record keeping issued by the Division. (Regulations, Part 516.)

[1] See India Rubber World, Mar. 1, 1941, p. 56.

Export Control Schedule No. 12 now includes revisions of earlier schedules for several machines and commodities including rubber, which require export licenses. Effective July 23, the following applies to the last-named: "Rubber—Crude, reclaimed and scrap containing 5% or more rubber. Rubber tires and tubes: automobile casings—truck and bus casings, other automobile casings, automobile inner tubes and other casings and tubes. Solid tires: for automobiles and motor trucks. Tire sundries and repair materials: camelback. Rubber belts and belting: fan belts for automobiles and other rubber and balata belting."

President F. D. Roosevelt, by Executive Order of June 28, created, within the Office of Emergency Management, the Office of Scientific Research and Development, with Dr. Vannevar Bush as director. The order creating the old National Defense Research Committee, of which Dr. Bush was chairman, has been revoked.

Stanco Distributors, 26 Broadway, New York, N. Y., on July 17 announced that the price of synthetic rubber produced by the Standard Oil Co. of New Jersey has been reduced 15¢ a pound. Until recently the Standard Oil Co. of Louisiana could not obtain enough butadiene for its planned production of synthetic rubber, but now the plant at Baton Rouge is operating at its designed annual capacity of 1,800 tons. Additional facilities are under construction, and the plant expects to turn out 300 tons a month, double the present capacity early next year.

Lee to Buy Own Stock

A. A. Garthwaite, president, Lee Rubber & Tire Corp., Conshohocken, Pa., by letter informed stockholders that the directorate had authorized the company to purchase 26,834 shares of stock, 10% of the outstanding shares. This action resulted from an offer by the estate of a deceased stockholder to sell a portion of its large block of shares to the company at $25 a share, the approximate market price at the time. The board feels the acquisition of these holdings to be highly advantageous in view of the fact that the book value of the stock as of May 31, 1941, was $39.02 a share, the net current asset value on the same date, $25.84 a share; and the book value will be considerably enhanced by this purchase.

Lee has had an excess of working capital for recent and current conditions, and the directors decided that after the purchase of the shares an adequate working capital will still remain to maintain the present level of business and allow for normal growth. Consequently the board invited tenders of stock at $25 a share to the extent of 26,834 shares from all stockholders of record July 11, 1941. The Guaranty Trust Co. of New York was named agent to accept tenders from stockholders until the close of business July 24, 1941.

Herman Muehlstein, president, H. Muehlstein & Co., 122 E. 42nd St., New York, N. Y., has been named chairman of the Rubber Committee of the Commerce and Industry Division of the United Service Organization Campaign.

EASTERN AND SOUTHERN

Allied News-Photo

S. C. Stillwagon

Stillwagon Resigns as Editor of INDIA RUBBER WORLD

S. C. Stillwagon who, since January 1, 1937, has been editor of INDIA RUBBER WORLD, has resigned that post, as of August 1 to take an executive position with the Hodgman Rubber Co., Framingham, Mass.

Before coming with INDIA RUBBER WORLD, Mr. Stillwagon had spent over 20 years in the rubber industry in technical and administrative positions. After attending Hiram College, he majored in chemistry at Case School of Applied Science and after graduating became associated with the General Laboratories of the United States Rubber Co. on research work. Then he was chief chemist of the Mechanical Rubber Co., Chicago, and was later connected with other divisions of U. S. Rubber.

As editor of INDIA RUBBER WORLD, Mr. Stillwagon gained a wide reputation as a writer and editorial commentator on subjects of direct interest to the rubber field.

His associates on the staff of INDIA RUBBER WORLD, while regretting his leaving, wish Mr. Stillwagon a full measure of success in his new venture.

His work will be carried on by Edward V. Osberg, also a chemist with wide experience in the rubber field, who has been associate editor of the paper for four years.

The Thermoid Co., Trenton, N. J., and its domestic subsidiaries reported June sales at $955,785, against $914,493 for May and $955,276 for June, 1940.

Mixing Equipment Co., Inc., 1029 Garson Ave., Rochester, N. Y., manufacturer of "Lightnin" mixers, at a recent meeting of the board named as vice president E. S. Bissell, technical sales manager of the company, which he joined in January, 1937.

New Plastics Organization

Plastics Materials Manufacturers' Association, Tower Bldg., 14th and K Sts., Washington, D. C., recently was formed to offer cooperation in utilizing plastics for defense purposes, to coordinate the resources of the member firms in a common effort, to promote safety measures and the general welfare of the plastics industry, increase the use of plastics in arts and industries, and study ways and means of eliminating waste in production and distribution.

Members of the new organization, an out-growth of the Cellulose Plastics Manufacturers' Association (founded in 1919), follow: American Plastics Corp., American Cyanamid Co., Bakelite Corp., Casein Co. of America, Catalin Corp., Celluloid Corp., E. I. du Pont de Nemours & Co., Inc., Durite Plastics, General Plastics, Inc., Monsanto Chemical Co., Nixon Nitration Works, Plaskon Co., Inc., Reilly Tar & Chemical Corp., Rohm & Haas Co., and Tennessee Eastman Corp.

Officers are Arnold E. Pitcher (du Pont), president, L. M. Rossi (Bakelite), vice president, and John E. Walker, secretary-treasurer. The Committee on Defense and Government Relations also was formed to act as a contact between the Association and the Army and Navy Munitions Board or any other government agency interested in the organization's activities. Mr. Rossi is chairman, J. C. Brooks (Monsanto) and E. C. B. Kirsopp (Rohm & Hass), members, and Messrs. Pitcher and Walker, ex-officio members.

American Cyanamid Co., 30 Rockefeller Plaza, New York, N. Y., has appointed N. A. Shepard chemical director, and his headquarters have been transferred from the Stamford, Conn., research laboratories to the New York office. Dr. Shepard has been relieved of his former duties in order to devote his full time to establishing and extending the contacts of the company with industrial and university laboratories, institutions, and technical societies engaged in work related to the field of activities of the company and its subsidiaries. Dr. Shepard will also study trends in chemical research and industrial developments and relate them to the present and future outlook for the company.

Reid L. Carr, president of Columbian Carbon Co., 41 E. 42nd St., New York, N. Y., has been elected a director of Irving Trust Co., New York.

A. R. Kemp, in charge of the organic chemical research and development work at Bell Telephone Laboratories, Inc., 463 West St., New York, N. Y., has been made an active member of the American Institute of Chemical Engineers.

Warren H. Jones
General Cable Technologist

Warren H. Jones, recently appointed assistant to the product manager for rubber insulated wire and cables at the General Cable Corp., began his successful career in the rubber industry as a compounder with the Seiberling Rubber Co., Akron, O., after his graduation from Cornell University (B.S. in chemistry) in 1921. The next year, however, he went to the Pharis Tire & Rubber Co., Newark, O., in a similar capacity, but was assistant superintendent when he resigned in 1926 to join the Rubber Service Laboratories Co., Akron. Then in 1928, Mr. Jones became technical superintendent of the Murray Rubber Co., Trenton, N. J. He has been with General Cable since 1930, first at the Rome, N. Y., plant and next (1936) at the Buffalo, N. Y., factory where he was named plant manager in June, 1940. This summer he was transferred to the headquarters manufacturing staff as assistant to the product manager.

Mr. Jones holds membership in the Masonic order, the Division of Rubber Chemistry of the American Chemical Society, the Buffalo Group, the Buffalo Chamber of Commerce, and the Cornell Club of Buffalo. He is also a golfer.

Married, he has two daughters, one 10 and the other 14. The Jones residence is at 353 Wardman Rd., Kenmore, N. Y.

New Jersey rubber manufacturers in general are somewhat concerned over the allocation of rubber supply. Some claim that the limiting of the amount of raw rubber interferes with their taking on any more good-sized orders for fear they cannot be handled. All companies continue busy, and some are running with two and three shifts. The Jos. Stokes Rubber Co. is operating to capacity at both the Trenton and Canadian plants; while The Precision Roll & Rubber Co., Yardville, reports increased business. Crescent Insulated Wire & Cable Co., Trenton, now operating with three shifts seven days a week on government orders, is the only Trenton plant working on Sunday.

General Atlas Carbon Co., 60 Wall St., New York, N. Y., through President Carl J. Wright, has announced that in settling the Henry L. Doherty estate it was found expedient to merge the operations of General Atlas with those of the parent company. Consequently General Properties Co., Inc., was formed, and, effective July 1, General Atlas Carbon Co., became General Atlas Carbon Division of General Properties Co., Inc., with executive offices continuing at 60 Wall St., Mr. Wright as general manager of the Division, and no change in operations of the company.

United States Housing Authority, Washington, D. C., recently issued instructions for all its construction projects curbing the use of metals, rubber, cork, and mica.

Pittsburgh Plate Glass Co., Grant Bldg., Pittsburgh, Pa., through President R. L. Clause has announced that the volume of business enjoyed the first half of 1941 was the greatest for any similar period in the company's history. Although net earnings were somewhat larger than those of the first six months last year, they did not show a proportionate increase with sales because of rising wage and material costs and the necessity of building large reserves for prospective taxes.

Pennsylvania Rubber Co., Jeannette, Pa., according to Chairman W. A. Atkins, has named H. W. Jordan, formerly vice president and merchandise comptroller of Montgomery Ward & Co., Chicago, Ill., president and director to succeed A. C. Bowers, resigned.

Thiokol Corp., Trenton, N. J., finds orders increasing. President Bevis Longstreth was on a business trip to the Dow Chemical Co., Midland, Mich.

Martindell Molding Co., Ewing Township, Trenton, N. J., will shortly erect another one-story addition to its plant after having recently completed an addition. New presses and other equipment will be installed in the proposed structure. Milton H. Martindell, president, stated the company has many orders on hand.

Hewitt Rubber Corp., Buffalo, N. Y., at a board meeting July 22, according to President Thomas Robins, Jr., elected as a vice president Benjamin T. Moffatt, previously eastern division manager with headquarters at 70 Pine St., New York, N. Y., where he will remain.

Mercer Rubber Co., Hamilton Square, N. J., is operating at capacity. William H. Sayen, president, toured the Midwest on business.

Glyco Products Co., Inc., 230 King St., Brooklyn, N. Y., has named Joseph DuBose Clark chemical director in charge of research and development. Dr. Clark has had many years of experience in this field including work for the Firestone Tire & Rubber Co., and Lambertville Rubber Co.

W. H. Stevens Arriving by Clipper June 26

W. H. Stevens Here to Study "Thiokol" Production

William H. Stevens, executive of the Monsanto Chemical Co., London, arrived in this country June 26 to study production of "Thiokol" self-sealing gasoline tanks and airplane parts at the request of the Ministry of Aircraft Production. Mr. Stevens, who has spent several weeks at the plant of the Thiokol Corp., Trenton, N. J., is now touring American plants to observe "Thiokol" fabricating methods and will return to England late this month.

80,000-Ton Synthetic Capacity Foreseen for Early 1943

By the Spring of 1943 total production of synthetic rubber in this country is expected to reach 80,000 tons a year. It is assumed that the combined production of the four government subsidized plants (Goodyear, Hydrocarbon Chemical & Rubber, Firestone, and U. S. Rubber) will be in the neighborhood of 40,000 tons annually by early 1943. The remaining 40,000-ton capacity will be supplied by privately financed plants.

U. S. Rubber Extends Scope

At a special meeting called in Jersey City, N. J., July 8, to amend the charter, stockholders of the United States Rubber Co., 1230 Sixth Ave., New York, N. Y., by a vote totaling 74% each of the preferred and the common stocks approved widening the charter, which has not been changed since incorporation in March, 1892. Demands of the national defense program necessitated the move, calling for a complete, modern restatement of the objects and charter powers of the company.

Action on Common Dividend

After a suit had been filed by a first preferred stockholder in the Federal Court of Newark, N. J., to enjoin payment of the dividend of 50¢ a common share by U. S. Rubber, payable April 30, 1941, to stockholders of record April 16, the judge issued a temporary order April 28 restraining payment of the dividend, pending decision of the court, which was received last month, denies the application for the injunction, and permits payment of the dividend after 90 days unless the preferred stockholder files an appeal to the higher court within that time.

Ware and Hudgens Advanced

G. T. Ward, manager of branch sales of the footwear division, has reported that A. C. Ware, formerly Atlanta district sales manager of the division, has been made manager of sales development, with headquarters in New York, where he will work with district sales managers in the development and strengthening of dealer activities. C. M. Hudgens, of the Atlanta footwear branch, has been appointed district sales manager there.

Vacation at Bristol Plant

The wire division of U. S. Rubber at Bristol, R. I., shut down July 12 for a week's vacation. Of the 600 employes those who have been with the company more than one year were paid for the time; while those with more than five years received two weeks' pay, in the interests of national defense, according to Factory Manager W. Armstrong.

Improved Industrial Tire Compound

A new rubber compound for industrial tires, which is claimed to effect substantial power savings through its low rolling resistance, but without any sacrifice in the tire's long wearing qualities, recently was announced by U. S. Rubber. The company further states that tests have proved electric trucks will operate at speeds up to 1½ miles an hour faster on the new compound than on standard compounds used on the same truck, at the same time reflecting a saving in battery consumption up to 30%. Known as General Purpose Compound, the new product will replace the company's former General Purpose and Rapid Transit Compounds and will be furnished on future industrial orders when specified.

New Self-Sealing Inner Tube

The company is now marketing a puncture-sealing inner tube, U. S. Master Seal, that features an inner layer of tacky rubber adhesive with a honeycomb retaining structure of harder rubber. Hundreds of cellular compartments are spaced to prevent the adhesive from flowing to the center under centrifugal action. The sealing material is said to preserve its tackiness in all temperatures.

Tires Wanted for 45-Year-Old Duryea

U. S. Rubber recently received an order for a set of tires for an 1896 automobile, believed the oldest model for which new tires have ever been asked. George M. Hughes, of Upper Darby, Pa., president of the Antique Automobile Club of America, requested two 38x2.50 and two 34x2.50 pneumatic tires for an 1896 Duryea car, as he (correctly) believed that the company made the pneumatics for the first Duryea model in 1895.

OHIO

Industrial Plants Corp., 919 Ohio Bldg., Toledo, O., and 90 W. Broadway, N. Y., on August 13 at 11:00 a.m. (E.S.T.) will hold a public auction sale of land, buildings, machinery, equipment, molds, trade marks, trade names of the Martin Custom Made Tire Corp., Elm St., Salem, O. Inspection is invited from August 4 to the date of the sale, and representatives will be on the premises. The sale is subject to the approval of the trustee and the District Court of the United States for the Southern District of New York. Warren A. Schenck, 251 W. 57th St., New York, is trustee for the Martin company, and Robert P. Stephenson, referee in bankruptcy.

Seiberling Rubber Co., Akron, according to Advertising Manager N. E. Malone, has named Douglas Mueller advertising assistant in charge of public relations. Mr. Mueller, who has had several years of newspaper experience, will assist in sales promotion for the company and also issue publicity releases both directly and in cooperation with Meldrum & Fewsmith, Seiberling's advertising agency.

The Oak Rubber Co., Ravenna, has announced the retirement to private life of E. E. Hall (Mrs. Albert W. Silenius), for the past decade head of the company's sales department. Her successor is James B. Mullen.

New Firestone Organization

John W. Thomas, president of The Firestone Tire & Rubber Co., Akron, on July 11 announced the formation of the Firestone Aviation Corp., with Leonard K. Firestone as president.

Management and operations of this subsidiary, centered in the Firestone plants in Akron, will be devoted exclusively to the development, engineering, production, and distribution of aircraft materials and equipment. Products currently being turned out by the new corporation for national defense and commercial uses include airplane tires, tubes, self-sealing fuel tanks, seadrome contact buoys, pilot seats, airplane wheel and brake units, besides many other items necessary to aircraft production.

A recent development, according to Mr. Firestone, is a new Channel Tread tire built especially to enable combat planes to land on sandy or muddy emergency fields on which a plane would normally bog down. Main feature of the tire is a concave-type tread design that gives fast ships landing stability and provides increased flotation.

Wilbur Shaw, sales manager of the aeronautics division of Firestone, holds the same position with the new concern.

The Firestone Tire company has delivered to the United States Army weeks ahead of schedule the first two Bofors 40-millimeter mobile anti-aircraft guns ever made in this country. The guns were made by another concern, but

Leonard K. Firestone

Firestone made mounts and carriages and assembled the entire device. In cooperation with the Army, Firestone redesigned and improved the original gun to reduce time and costs of production. The company's machine shop organization of 800 skilled mechanics has formed the nucleus of the new staff of workers in the gun plant. A school for apprentice machinists is being conducted by Firestone to supplement this nucleus with an additional force of 1,000 skilled workers. Expanding its machine shop facilities in Akron by the construction of a huge new $1,500,000 plant with ten acres of floor space, Firestone will be able to turn out guns in quantity by early autumn.

The Firestone annual outing will be held August 8 at Euclid Beach Park.

Goodyear Announcements

J. R. Kelley, formerly shift foreman in the Akron balloon room of the Goodyear Tire & Rubber Co., has been made superintendent of the Goodyear Fabric Corp., New Bedford, Mass., now making barrage balloons and life rafts for national defense.

Dehydrated Foods in Pliofilm Containers

Packaging of dehydrated foods, including soup mixes, in Pliofilm containers recently was announced by Goodyear. Soups normally have a higher percentage of water content than any other prepared, packaged food product, averaging at least 80% water and thus resulting in increased shipping, handling, and storage costs. But by packaging dehydrated soup ingredients in Pliofilm, which protects the contents from absorption of moisture, all essentials for a quart of soup, except water, come in an envelope type of package about 4½ by 5½ inches, less than an inch thick, and averaging less than three ounces in weight.

Already one manufacturer alone has ordered Pliofilm for 100 million packages of its soup mixes, and chain stores are distributing these products nationally.

Other important dehydrated foods being packaged in Pliofilm containers include yeast, buttermilk, molasses, malt, and malted milk—and many others soon will be on the market.

Goodyear recently announced the successful odor-proof packaging in Pliofilm of smoked herring, smoked salmon, fillets, and other fish products. Pliofilm prevents oil from soaking through to make the package slimy and prevents escape of any odor even when packages are exposed to high room temperatures for long periods. The heat sealed packages range from individual wrappings to fractional pound lots for stores. Many marketers of fish products mount small packages on display boards, and individual packages may be torn off as sold.

Waterproofing Paper

Waterproofing of common Kraft paper, widely used for inexpensive packaging of bulk commodities, is being accomplished by use of Goodyear Pliolite, which has been used for several years on high-grade papers. Practicability of applying Pliolite to kraft paper for waterproofing has been demonstrated by extensive usage in test markets prior to formal announcement. Kraft paper protected with the moisture, vapor-proof properties of Pliolite will be used by many paper bag manufacturers.

Purpose of the Pliolite-coated kraft is to prevent the moisture from entering the bag, thereby keeping the contents in a factory fresh condition. Moisture-proof kraft paper can be used in the usual methods of bag manufacture, and, if desired, the bag may be heat-sealed to give a hermetically sealed package. The Pliolite coating reduces the moisture-vapor transfer rate of the paper over one thousand-fold and is the most efficient moisture-vapor-proof coating Goodyear's laboratories have yet developed.

The new product is available to bag manfacturers through their established paper sources, or complete technical information on the subject may be obtained from the Pliolite Sales Division at Goodyear.

Goodrich Personnel Changes

W. S. Richardson, general sales manager of the mechanical division of The B. F. Goodrich Co., Akron, has announced the following changes in sales personnel: O. C. Mueller, transferred as sales representative from Cincinnati to Pittsburgh, and succeeded at Cincinnati by A. C. Lutz; J. M. Cooney, transferred from Cincinnati to Dayton, O.; B. E. Silver, from the manufacturers' sales department in Washington to the hose sales department at headquarters in Akron; and J. V. Powers, from sales correspondent in the New York district office to field representative of the district with Albany headquarters.

A. D. Moss, director of purchases, last month announced the appointment of

Terrence E. Williams, of the Goodrich physical testing laboratories, as assistant secretary of Goodrich Co. (SS) Ltd., the crude rubber buying office at Singapore. Mr. Williams, who left Akron on July 5 for the Far East, is a graduate of Akron University (B.S., '34, M.S., '37) and a member of Lambda Chi Alpha fraternity.

K. D. Smith, tire development engineer and for the past nine years technical superintendent of the Goodrich tire division, has been named assistant to T. G. Graham, vice president in charge of factory operations.

Charles B. O'Connor, general sales manager of the tire replacement division, is on an extended leave of absence because of ill health, according to James J. Newman, vice president in charge of the division.

Following the recent semi-annual service pin presentation of the Twenty Year Service Club, Goodrich reported it has more than 3,000 workers on its active payroll with more than two decades of service. Thirty-year emblems have been given to 420 employes; 40-year pins to 50, and two workers have passed the half-century mark.

Large Conveyer Belt Order

Goodrich has received from Contractors, Pacific Naval Air Bases, an order for 25,600 lineal feet of cord conveyer belting for use in national defense construction work at Honolulu, Hawaii. The belting will be used in excavating for the underground fuel storage system and in handling the dirt and rocks either to the waste dump or to the aggregate plant where the dirt will be removed and the rocks sorted according to size for use as aggregate in the concrete.

New Inner Tube Aids Wheel Balance

Goodrich, through the inventors, E. H. Barder, superintendent of the company's tire division, and C. E. Snyder, chief of tube construction, has been granted a patent for a new type of inner tube which facilitates the balance of wheel assemblies. A feature of the tube, increased thickness of the wall around the valve stem, results in sufficient added weight to apply an adequate corrective force to effect a balance of the tire and tube assembly. The tube already is in production for original equipment orders as well as in sizes of 6.50 and upward for the replacement market.

New Tires

Mr. Newman has recently announced several new tires. For passenger cars is the DeLuxe Silvertown with a tread of "variable pitch" design having the basic bar design broken up by narrow indentations, called kerfs, scientifically placed for noise elimination and maximum skid resistance. Other tires in Goodrich's 1941 Silvertown line—all utilizing Duramin and Safety-Weld—are Patrician Silvertown, Ameripol Silvertown, Life-Saver Tread Silvertown, Safety Silvertown, and Standard.

Speedliner Silvertown, for trucks and buses, is said to give 25% more mileage than any other regularly-priced truck tire the company has ever made because of a change in construction making possible the use of a thicker, wider, and flatter tread for contact with the road.

Also available is a new implement tire that permits the movement of farm vehicles over paved highways for interfield work with savings in time and cost, and features a thick, heavy tread and deep self-cleaning circumferential ribs to prevent side-slip on hills. The added tread rubber also imparts increased resistance to stone and stubble bruises. The tire, adaptable to all types of free-rolling or non-traction wheels, will supplement the firm's present implement tire with its non-directional, V-type tread.

The Diamond Tire Division is now marketing the Premium Quality for passenger cars. The new tire bears an unusually thick tread and is strengthened with heat-resisting Hi-Density cord; while the use of Diamond's Shock Cushion construction resists the effect of road shocks. Premium Quality comes with the new reversible sidewall design, one side white, the other black.

Vibro-Insulators Help Defense Program

Goodrich's Vibro-Insulators are being used at the Cadillac division of General Motors, now making airplane engines, on machines in locations on the production lines which previously had been segregated on the first floor because their excessive vibration interfered with precision equipment, such as grinders and precision boring machines. Now, however, machines equipped with the vibration eliminators are located near finish grinders without any interference with the more sensitive machines.

Giant Bomber Uses World's Largest Deicers

The "B-19", world's largest bomber now being tested in California preliminary to delivery to the U. S. Army Air Corps, will be equipped with the largest set of deicers ever built which contain enough rubber to provide deicer protection for 14 military pursuit ships, according to Goodrich. Weighing 395 pounds—or more than three times as much as the installation for the *Atlantic Clipper*, previously the largest set built—the overshoes for the 80-ton aerial fortress have six times the area of those on a regular 21-passenger commercial transport plane and are 287 feet long.

The Union Oil Co. of California, Los Angeles, Calif., was scheduled to start production at its new wax plant, at Oleum, Calif., on July 1. The waxes for production are said to have a high tensile strength and a small crystalline structure, with melting point ranges of 145 to 150° F. and 160 to 165° F. Applications cited include use in connection with rubber compounding. Bearing the "ARISTO" trade name, the waxes will be marketed throughout eastern United States and the export field by Petroleum Specialties, Inc., 570 Lexington Ave., New York, N. Y.

NEW ENGLAND

Warwick Chemical Co., West Warwick, R. I., has transferred Donald S. Collard, for many years superintendent in charge of manufacturing, to the Rock Hill, S. C., plant as resident manager.

Rhode Island's general industrial conditions in June, according to State Director of Labor William Connelly, were slightly under May, but above June, 1940. The rubber manufacturing industry maintained a substantial gain over a year ago, but experienced a comparatively small seasonal decline. During June the eight rubber concerns employed 4,955 persons, against 4,924 in May and 3,977 in June, 1940. Payrolls totaled $445,000 in June, 1941, against $305,000 in June, 1940. In June this year these firms used 2,785,000 kilowatt hours of electric power, against 1,302,000 in June, 1940.

Boston Woven Hose & Rubber Co., Boston, Mass., has announced that Walter W. Evans, formerly director of research at the Ludlow Mfg. & Sales Co., Boston, has joined its organization to inaugurate a research program relative to national defense. Mr. Evans had previously been connected with The B. F. Goodrich Co., The Philadelphia Rubber Works Co., both of Akron, O., and R. T. Vanderbilt Co., New York, N. Y., and is a past chairman of the Division of Rubber Chemistry, A. C. S.

Priorities Affect R. I. Firms

Priorities are reported as more or less affecting various industries in Rhode Island, especially wire manufacturers, for whom the restrictions on copper and rubber are said to be particularly stringent. Also hard to obtain for other than defense purposes, by producers of insulated goods, are rayon, cotton tape, and asbestos.

As a result, one factory which formerly had about 400 employes, cut down from a 40-hour schedule to 32 hours and lost a number of operators to mills working full shifts. This plant lacks equipment to make the heavier types of wire which figure in defense; its business has been largely to supply wire for home lamps and appliances, a purely civilian enterprise, which, according to the head of the plant, is virtually doomed by the insistence of copper suppliers on priorities. To adapt the plant to defense requirements he is building an addition and buying new equipment, but he has been handicapped by delay in getting the machinery because of lack of those priorities—he ordered it last fall. He expects to resume full operations by October.

For the larger wire making and insulating plants in general now working at or near capacity on three shifts mostly on defense orders, the tightening up of priorities has not yet greatly affected output, although one plant reports "some curtailment", principally on small non-defense orders.

MIDWEST

Crowley & Bennett, recently organized firm of technical consultants consisting of Clyde A. Crowley and Harry Bennett, has its main office at 6803 N. Clark St., Chicago, Ill., and an eastern branch at 228 King St., Brooklyn, N. Y. The Chicago laboratories are equipped for electro-chemical, lubrication, metallographic, and other highly specialized problems. Mr. Bennett, formerly editor-in-chief of "The Chemical Formulary", also has had experience on coatings, finishes, plasticizers, and tackifiers for rubber and synthetics and solvent-proof seals for rubber and synthetic hose.

Paramount Rubber Service, Inc., 1430 Rosedale Court, Detroit, Mich., on July 4 suffered complete loss of its plant by fire. By July 11 the firm was operating its sheet rubber department in temporary quarters, and on July 15 the molded goods department resumed production. The concern plans soon to acquire a new and larger plant, where it can enlarge operations to include such large units as tank car insulation. The firm name will also be changed to Paramount Rubber Co. President H. Tom Collard has stated that the company at present is running about 80% on defense work and about 20% on domestic requirements. Other officers are: vice-president, Howard A. Miller; treasurer, Karl M. Doeren; and secretary, Edwin J. Post.

Sears Roebuck & Co. and **Montgomery Ward & Co.,** mail-order houses, both of Chicago, Ill., in their new fall-and-winter catalogs have raised tire prices. Sears has also introduced a new inexpensive tire, "All State Emblem."

The Thiokol Corp., Trenton, N. J., has just announced that Wm. B. Davies, formerly with the Gates Rubber Co., Denver, Colo., and more recently with the Schacht Rubber Co., Noblesville, Ind., has joined the Thiokol organization and will represent the firm in the Midwest, with headquarters at Detroit.

CANADA

Manufacture in Canada of white wall tires, except under license, has been prohibited as of July 5 by order of J. H. Berry, motor vehicle controller in the Department of Munitions and Supply, Ottawa, Ont. Tire walls, Mr. Berry said, are usually colored by means of zinc oxide pigment. The new decree, therefore, would serve to divert substantial quantities of zinc to essential war industries. White wall tires also require more rubber than ordinary tires; so consumption of rubber would be reduced, and the manufacturing capacity thus saved be made available for war orders.

Rubber Consumption to Be Cut?

Measures to reduce rubber consumption in the United States may be followed shortly by similar action in Canada. A. G. Partridge, president of the Goodyear Tire & Rubber Co. of Canada, Ltd., New Toronto, Ont., commenting on this action, declared that while the United States reduction order would not affect Canada, it would likely result in similar action by Dominion authorities. If sufficient shipping facilities are not available to maintain a full rubber supply to the United States, it is probable, Mr. Partridge said, that Canadian authorities will also control rubber consumption. Canadian supplies, however, do not come through the United States, and until the government in Canada takes action, the Canadian picture will be unchanged.

But A. B. Hannay, managing secretary of the Rubber Association of Canada, stated that the recent United States order to conserve rubber would not affect Canada and expressed surprise that there should be a feeling that Canadian supplies are threatened and likely to be curtailed. He said he failed to recognize the probability that United States curtailment would automatically affect Canadian rubber companies which did business via the United States.

Dominion Department of Munitions and Supply, Ottawa, Ont., recently awarded the following contracts: Canadian General Rubber Co., Ltd., $75,385; Dominion Rubber Co., Ltd., $156,121; Dunlop Tire & Rubber Goods Co., Ltd., $24,743; Firestone Tire & Rubber Co. of Canada, Ltd., $567,346; Goodyear Tire & Rubber Co. of Canada, Ltd., $315,951; Kaufman Rubber Co., Ltd., $39,720.

Bryce Stewart, deputy minister of labor in the Dominion Government, estimates that by the end of 1941 the number of workers making rubber tires for military vehicles will have increased from 1,800, as at present, to 2,200.

Shawinigan Chemicals, Ltd., Montreal, P. Q., plans erecting a plant to manufacture polyvinyl chloride for use in covering cables, especially degaussing cables for submarine protection, and for gaskets and airplane parts. The plant, for which much special equipment is needed, is expected to be in operation early next spring. Polyvinyl chloride is not produced at present in Canada, and domestic demand in the United States has taxed facilities there to capacity. Determination to produce the material in the Dominion arose from the fact that all the ingredients required can be had in large quantities in or near Shawinigan Falls, P. Q.

Robert James Fletcher, 63, for 33 years with the Dominion Rubber Co., Ltd., in Montreal, P. Q., died at his home there recently. He was a native of Gloucester, England, and previous to joining Dominion in 1908, had been employed by the C.P.R.

Naugatuck Chemicals, Ltd., Elmira, Ont., besides President P. C. Jones and Vice President John P. Coe, announced last month, has named the following other company executives: treasurer, M. O. Simpson, of Dominion Rubber Co., Ltd., Montreal, P. Q.; secretary, I. W. Holme; assistant secretary-treasurer, G. R. Dobbin; general manager, R. B. Marr, formerly chief chemist of Dominion Rubber and factory manager of its Montreal plants; factory manager, Harry Wintsch, formerly assistant to the production manager of the Naugatuck Chemical Division of United States Rubber Co., Naugatuck, Conn.

Albert B. Maloney, 40, former manager at Ottawa for the Dunlop Tire & Rubber Goods Co., Ltd., Toronto, Ont., and once noted athlete, died in an Ottawa hospital July 13.

OBITUARY

Charles M. Knight

AFTER a brief illness Charles M. Knight, credited with having established the first rubber courses in an American university and one of the organizers of the Division of Rubber Chemistry, American Chemical Society, died in Coral Gables, Fla., July 3. Born in Dummerston, Vt., 93 years ago, he attended Westbrook Seminary and Tufts College (A.B., 1873) and then worked as a railroad engineer a short time before taking up teaching.

After graduate courses at Harvard and M.I.T., Dr. Knight lectured at Goddard Seminary, Tufts, and Buchtel College (now Akron University), where he served as professor of natural sciences, head of the department of chemistry and physics, and then dean, retiring in 1913. It was here that he began a class in rubber chemistry. Dr. Knight also did chemical work for The B. F. Goodrich Co. years before companies hired regular chemists.

When the Rubber Section of the A.C.S. was founded, the deceased was appointed chairman of the committee to organize standard methods of rubber analysis.

A widower, Dr. Knight leaves two sons and a daughter, as well as a sister.

Funeral services were held in Akron, July 7, with burial in Mt. Peace Cemetery.

Wm. F. Larkins

WILLIAM F. LARKINS, 85, died recently at his home in Hamilton Square, N. J., after a lengthy illness. He was a hosemaker at Mercer Rubber Co., Hamilton Square, for more than 55 years until he retired a few years ago. A widower, he is survived by a daughter. Interment was in New Egypt (N. J.) Cemetery.

Otto Kruse

OTTO V. KRUSE, 54, since 1939 general sales manager of The Baldwin Locomotive Works, Philadelphia, Pa., died at his home in St. Davids, Pa., July 1. A graduate of Cornell University (1909), he was active in the hydroelectric industry up to 1917 when he became a consulting engineer for Larner Engineering Co. and the William Cramp & Sons Ship & Engine Building Co. Mr. Kruse was subsequently appointed general sales manager of the miscellaneous machinery business of Cramps. In 1931 Baldwin Locomotive acquired this business, and the deceased later was made general sales manager and then assistant general manager of the division known as Baldwin-Southwark Corp.

Mr. Kruse was president of the American Hydraulic Corp., a director of the Cornell Alumni Corporation, and a member of the American Society of Civil Engineers, The Franklin Institute, The Masons, Alpha Tau Omega, Marion Cricket Club, and the Union League.

He leaves his wife and two sons.

Harold Read

HAROLD READ, 52, for 20 years purchasing agent at the General Cable Co.'s, Pawtucket, R. I., plant, died at work of a sudden heart attack July 21. He had been with the company about 25 years. He leaves a wife, a daughter, and three sons.

Wm. G. Sewall

ON JULY 14, William Gilman Sewall, who in 1911 acquired 40,000 acres of rubber and wheat plantations in Kenya Colony, Africa, died in a New York, N. Y., hospital of a cerebral hemorrhage. He was born in Boston, Mass., 67 years ago and attended Noble & Greenough School and Harvard University. A noted game hunter and member of the Royal Geographical Society, during the World War he was also a captain in the British Army.

Funeral services were held on July 16. Burial was private.

The deceased is survived by a brother a niece and a nephew.

Arthur J. Davis

CORONARY thrombosis caused the death, on July 1, of Arthur Jones Davis, a director and purchasing agent of the Goodyear Footwear Corp., Providence, R. I., and secretary-treasurer of the Rhode Island Rubber Club. Mr. Jones was born in Staplehurst, England, July 3, 1884, where he was educated and then taught school.

When he came to the United States, he secured employment with the Brown & Sharpe Mfg. Co., Providence, R. I., as storeskeeper. In 1910, however, Mr. Davis joined the Bourn Rubber Co., Providence, as purchasing agent and continued as such when the company was taken over by Phillips-Baker Rubber Co. In 1937 the Goodyear Footwear Co. was organized, and the deceased,

Arthur J. Davis

who had been very active in its formation, was made a director and purchasing agent.

Mr. Davis was also an officer of Orpheus Lodge, F. & A. M., Providence, and a member of the Rhode Island Association of Purchasing Agents.

The funeral took place on his birthday, with interment in North Burial Ground, Providence.

Survivors include the widow and several brothers and sisters.

FINANCIAL

Unless otherwise stated, the following results of operations are after operating expenses, federal income taxes, and other deductions. Additional tax charges under the Revenue Act of 1940 have been made against earnings in many reports. Figures in most cases are subject to audit and final adjustments.

Anaconda Wire & Cable Co., New York, N. Y. March quarter: consolidated net income, $748,811, equal to $1.77 each on 421,981 common shares, against $129,280, or 31¢ a share, last year.

Belden Mfg. Co., Chicago, Ill. March quarter: net income, $182,915, after estimated provision of $123,000 for federal taxes, against net income of $100,178 last year; capital stock outstanding, 241,547 common shares.

Brown Rubber Co., Inc., Lafayette, Ind. March quarter: net profit, before provision for federal taxes, $62,686, equal to 31¢ a share on the outstanding stock.

Brunswick-Balke-Collender Co., Chicago, Ill., and subsidiaries. March quarter: net profit after foreign exchange adjustments, loss on sale of securities and excess profits taxes, $143,756, equal, after preferred dividends, to 25¢ each on 444,655 common shares; net sales, $2,951,738, against $2,422,007 last year. Profit included credit of $79,376 from adjustment of prior year excise taxes. Net profit for first quarter of 1940, $118,226, or 18¢ each on 444,455 common shares.

Crown Cork & Seal Co., Inc., Baltimore, Md., and wholly owned domestic subsidiaries. March quarter: unaudited net profit, $526,636, equal, after preferred dividend requirements, to 77¢ each on 517,614 common shares, against revised net profit last year of $405,455, or 54¢ a share.

Dominion Rubber Co., Ltd., Montreal, P. Q., Canada, and subsidiaries. For 1940: net profit, after depreciation, interest, $238,700 income taxes, etc., $189,646, equal to $6.32 each on 30,000 shares of 7% non-cumulative preferred stock, contrasted with net loss of $163,728 in 1939; current assets, $6,686,768; current liabilities, $1,618,588; net working capital, $5,068,180, against $4,507,108 the end of December, 1939.

Dominion Textile Co., Ltd., Montreal, P. Q., Canada. Year ended March 31, 1941: net income, after depreciation allowance of $2,000,000, bond interest and amortization, provision of $4,192,456 for income and excess profits taxes, reserve against future depreciation in inventory values, and other charges, $2,034,146, equal, after preferred dividend requirements, to $7.03 each on 270,000 common shares, against $2,214,070 in the preceding fiscal year after $1,748,704 for depreciation, $831,899 for income taxes and other deductions, but before $261,021 representing unamortized bond premium and discount and $250,000 reserve for pension fund, which sums were deducted from the surplus account.

General Cable Corp., New York, N. Y. March quarter: net profit, $1,006,006, equal, after quarterly dividend requirements on 150,000 shares of 7% preferred stock, and allowing for dividends on 306,689 shares of $4 Class A stock, to 65¢ each on 671,858 no-par shares of common, contrasted with net profit last year of $727,425, or 23¢ each on 664,558 common shares then outstanding.

General Electric Co., Schenectady, N. Y. March quarter: net profit, $11,377,696, or 39¢ a common share, against $11,951,450, or 41¢ a share, in the first three months last year; net sales billed, $129,860,707, the largest for any quarter and contrasted with $85,949,194 in the corresponding period of 1940; orders received, $257,382,000, an all-time high for any quarter, against $97,490,000 last year.

Hercules Powder Co., Wilmington, Del. First quarter, 1941: net earnings, after provision of $2,018,440 for estimated federal taxes, $1,360,426, equal, after preferred dividend requirements, to 93¢ each on 1,316,710 common shares outstanding, against $1,752,573, or $1.12 a share, in 1940.

General Motors Corp., Detroit, Mich. March quarter: consolidated net earnings, including equities in earnings of subsidiaries, not consolidated, $62,303,782 after all charges, taxes, and a $10,000,000 reserve for contingencies, equal, after preferred dividend requirements, to $1.44 a common share, compared with $64,733,906, or $1.50 a share, in the like period last year; net sales $69,129,619, against $458,150,556.

I. B. Kleinert Rubber Co., New York, N. Y., and subsidiaries, excluding English branch. For 1940: net profit, $143,757, equal to 87¢ each on 164,140 capital shares, excluding 25,860 shares in treasury, contrasted with $289,364, including results of English branch, equal to $1.76 on 164,645 shares, in 1939; current assets, $2,123,585, and current liabilities, $345,171, against $2,312,098 and $375,756, respectively, on December 31, 1939.

Rome Cable Corp., Rome, N. Y. Year ended March 31: net profit after excess profits taxes and a reserve of $40,000, against future price decline in copper, $385,460, equal to $2.03 each on 189,830 common shares, against $288,813, or $1.52 a share, after a reserve of $8,924, against price decline in copper, in the preceding fiscal year.

Lee Rubber & Tire Corp., Conshohocken, Pa. Six months ended April 30: net profit, $450,704, equal to $1.68 a share on outstanding stock, against $456,094, or $1.70 a share, in the half year to April 30, 1940; sales, $7,514,203, against $6,263,978.

Okonite Co., Passaic, N. J. For 1940: net income, $419,063, against net loss of $36,258 the year before.

Phelps Dodge Corp., New York, N. Y. First quarter, 1941: net income, after provision for all federal taxes, but before depletion, $3,700,000, or 73¢ a share, against $2,412,000, of 48¢ a share, in the March quarter last year.

Socony-Vacuum Oil Co., Inc., New York, N. Y. For 1940: consolidated net income, after all charges, taxes, and reserves, $36,409,055, equal to $1.17 each on 31,708,452 capital shares outstanding, contrasted with $34,452,710, or $1.10 a share, in 1939.

The Timken Roller Bearing Co., Canton, O. March quarter: net earnings, $2,613,451, or $1.08 each on 2,415,380 capital shares outstanding, against $2,887,518, or $1.20 a share, in the first quarter of 1940.

Skelly Oil Co., Tulsa, Okla., and subsidiaries. March quarter: net income, $898,917, equal to 91¢ each on 981,348 common shares, against $773,281, or 68¢ a share, on 995,348 common shares, last year. Twelve months to March 31: net income, $3,442,314, or $3.47 a common share, against $2,894,984, or $2.53 a common share, for the year ended March 31, 1940.

Thermoid Co., Trenton, N. J., and domestic subsidiaries. March quarter: unaudited net profit, $210,343, equal, after preferred dividends, to 38¢ each on 476,388 common shares, against $135,208, or 22¢ a share, last year. Twelve months to March 31: net profit, including $50,000 reserve for possible federal excess profits tax and contingencies, $677,875, or $1.17 a common share, against $502,439, or 80¢ a share, for the previous 12 months.

United Carbon Co., Charleston, W. Va., and subsidiaries. March quarter: net profit, $540,028, equal to $1.36 each on 397,885 shares of common stock, against $495,184, or $1.24 a share, in the first quarter of 1940. No provision has been made for excess profits taxes, as these are not determinable at this time.

(*Continued on page* 83)

FROM OUR COLUMNS

Fifty Years Ago—August, 1891

To stick rubber to iron, all grease must be removed from the iron, usually by dipping in acid. If it can be conveniently done, plate the iron with a thin film of brass, and then see if the rubber does not stick. (p. 294)

To Charles D. Mead, who started the Mercer Rubber Co. and the Hamilton Rubber Co., is popularly ascribed the introduction of the jar ring. (p. 294)

Siemens and Halske have evolved a process of vulcanizing which enables them to produce rubber of high resisting power. . . . A proof of this was given by submitting a sheet of rubber vulcanized by the new process, the thickness of the rubber being only .006-inch, to a potential of 20,000 volts. The rubber was not pierced by the current. (p. 297)

U. S. patent No. 452,876, Christian H. Gray, Silvertown, England, is for an air-cushioned tire, lined wholly or partially with viscous or plastic rubber, which will provide for the closing up of holes that are made in the air cell of the tire. (p. 303)

The number of mills making rubber substitutes is computed to be twenty-six, of which there are six in this country. (p. 305)

Both in France and in England frequent experiments have been made to discover if vessels of war could not be sheathed in India rubber in such a manner that they would resist shot and shell to better advantage than when metal sheathed. (p. 310)

A curious earth that has not as yet received much attention from the rubber men . . . is what is known as "Fossil Flour." (p. 312)

25 Years Ago, August, 1916

Thirty-five years ago the first Royle tubing machine was put into service. (p. 615)

Of interest to the rubber trade was the arrival of the German submarine "Deutschland" at Baltimore last month where it took on cargo to carry back to Germany. Despite the secrecy which was maintained regarding this cargo, it is a practical certainty that it comprises in part approximately 150 tons of Upriver fine rubber. (p. 618)

Since 1910-11, when the Firestone Tire & Rubber Co. moved into its new factory, the sales have grown from $7,462,581.17 to $25,187,884.33, making a total increase of 257% for the past five years. (p. 620)

From a survey of the reports of various rubber companies in the Federated Malay States, it would appear that the average cost of production, f.o.b. steamer, including all expenses, except interest charges on investment, was, during 1915, approximately 25¢ per pound on well managed plantations in full bearing. (p. 629)

Tire Production Statistics

	Pneumatic Casings		
	Inventory	Production	Shipments
1939	8,664,505	57,612,731	57,508,775
1940	9,126,528	59,186,423	58,774,437
1941			
Jan.	9,797,253	5,486,296	4,849,748
Feb.	10,028,803	5,161,267	4,896,340
Mar.	10,148,861	5,685,559	5,517,255
Apr.	9,957,849	5,822,699	6,049,517
May	8,373,324	6,072,823	7,732,828
June	7,079,458	6,362,626	7,664,431

	Pneumatic Casings		
	Original Equipment	Replacement Sales	Export Sales
1939	18,207,556	38,022,034	1,279,185
1940	22,252,869	35,345,656	1,175,912
1941			
Jan.	2,291,209	2,424,730	133,809
Feb.	2,546,120	2,203,297	146,923
Mar.	2,638,066	2,728,557	150,632
Apr.	2,333,827	3,582,579	133,111
May	2,700,419	4,885,166	147,243
June	2,756,996	4,761,344	146,091

	Inner Tubes		
	Inventory	Production	Shipments
1939	7,035,671	50,648,556	51,190,314
1940	7,016,948	52,237,003	52,214,079
1941			
Jan.	7,632,655	5,112,824	4,473,942
Feb.	7,924,383	4,887,190	4,610,313
Mar.	8,068,646	5,349,202	5,181,198
Apr.	8,142,692	5,495,762	5,371,451
May	7,686,194	5,854,617	6,323,718
June	7,053,971	6,279,813	6,921,985

	Inner Tubes		
	Original Equipment	Replacement Sales	Export Sales
1939	18,190,630	31,997,906	1,001,778
1940	22,172,452	29,069,547	972,080
1941			
Jan.	2,281,274	2,082,311	110,357
Feb.	2,545,877	1,932,703	131,733
Mar.	2,647,533	2,405,927	127,738
Apr.	2,336,715	2,919,614	115,122
May	2,688,870	3,508,095	126,753
June	2,726,892	4,082,752	112,341

Source: The Rubber Manufacturers Association, Inc. Figures adjusted to represent 100% of the industry.

LATIN AMERICA

HAITI

Thomas A. Fennell, agricultural advisor to the Haitian Government, reports[1] that the corporation formed through cooperation of the governments of Haiti and the United States[2] will encourage the planting of improved strains of high-yielding rubber plants by local growers and will furnish yearly, within three years, enough budded rubber plants to plant at least 2,500 acres annually for ten years. The immediate objective is the establishment of rubber plantations totaling 7,500 acres. Rubber seeds and seedlings for the purpose are already available. Four principal areas in Haiti are well adapted to rubber growing: the Grand Anse Valley, where a cooperative propagation and breeding station has already been established; the Bayeaux Valley on the northern coast, where a plantation was started in 1903, abandoned in 1912, but where experimental tapping of the trees was conducted in 1924-25 by the United States Department of Agriculture, and where these 38-year-old disease-free trees still exist; the lower Cayes Plain on the southern coast; and the North Plain. The work of the corporation will be concentrated in these areas. In return for its services the Government will give the corporation exclusive right to purchase all rubber produced in Haiti.

The corporation plans to enter into contracts with owners of small farms to grow rubber, cacao, and other products to be developed, and it will also provide seed and technical supervision and assistance, and purchase the crops after they are harvested. The corporation's land holdings will be limited to its central plantations to be used mainly for demonstrations and experiments. All agricultural labor to be hired for the plantations will be recruited in Haiti.

An important unit of the corporation will be its research division which will make trial plantings of *Hevea* trees and other promising crops in potential producing areas. By measurement and observation of the growth and behavior of plants under these conditions, in two or three years it will be possible to tell the types of growth to be expected.

If the plan is fully carried out, a final planting of nearly 70,000 acres of high-producing *Hevea* trees will result. This acreage, representing nearly 35,000 tons a year after the plantings reach full production, will give more than 5% of the total United States rubber consumption in a normal year.

[1] *Agriculture in the Americas*, July, 1941, pp. 7-11, 15. See also INDIA RUBBER WORLD, May 1, 1941, p. 50, July 1, 1941, p. 55.
[2] *Ibid*, June 1, 1941, p. 59.

See page 97

BRAZIL

Cafelite—a New Plastic

For years Brazil had been combating the depression of coffee prices, caused by its own huge production, by burning the surplus. But this is to be changed, for Brazil plans converting its surplus into a plastic, cafelite, which it is said will be marketable at a considerably lower price than any other similar material. The product was developed in 1939 by H. Polin, of the Polin Laboratories, New York, N. Y., U. S. A., and after the Brazilian Government became interested, an experimental factory was built in Sao Paulo. Evidently the experimental work proved satisfactory, for it is planned to start a large factory at Sorocaba to cost $3,500,000.

The new plastic is available in powder form, molds well, and combines easily with a number of more expensive synthetic resins and also latex. Combined with the latter, it is said to yield a product that is cheaper than rubber, has rubber-like properties, but is harder and more resistant to friction.

The process of making cafelite is cheapened by the production of various valuable by-products as (1) caffeine; (2) an oil which, it is claimed, can compete with cottonseed oil and after slight modification can also be used for various purposes in chemical industries; (3) cellulose, which it is expected will replace a large part of the material now imported for manufacturing paper; and (4) furfural.

Exports and Imports

During the first quarter of 1941, imports of tires and tubes for automobiles declined to 312 tons, against 933 tons in the same period of 1940.

Crude rubber exports from Brazil have remained practically stationary during the last three years: 12,037 tons in 1938, 11,805 tons in 1939, and 11,835 tons in 1940. In 1938, Germany was the largest importer of Brazilian rubber, taking over 7,000 tons, but in 1939 and 1940 the United States was first, having bought an average of 50% of the total exports.

EUROPE

GERMANY

Steel Cord Tires

Pneumatic truck tires in which steel wire cord is used in place of the usual textile cord are reported in use in Germany. The steel wire is made up of many fine strands twisted together to form a thin, very resistant steel cord. The new type of tire is said to be built up very much like a normal cord tire. The individual wires are placed at the usual 45 degree angle, one layer crossing the other. The layers of rubber between are extra thick and there are additional reenforcing layers of a very tough, light-colored rubber reaching from the top to the sides of the tire. The wires are farther apart than cotton cords, and the plies are whipped round the bead and anchored there. The new tire has one normal strip of carcass fabric of the normal width, but the threads are twice as far apart as usual.

Where the normal truck tire has 12 to 14 plies of cotton, the new tire has only four plies of wire so that the added weight is offset by a thinner carcass. The steel cord tire does not offer greater resistance to deformation than the usual tires, but surprisingly enough the tire temperature is higher, averaging about 85° against about 75° in ordinary cord tires.

The new tires, already produced in small series of different sizes, are said to have given satisfactory service, and it is hoped that mass production soon will be started.

Duden Resigns from Dechema

At the twentieth session of the Grand Council of the Dechema, German Society for Chemical Plant, at Frankfurt a.M., April 8, the president, Paul Duden resigned in favor of Alfred Pott, of Gleiwitz. In recognition of his valuable services, the Dechema has made Professor Duden an honorary member of the society with the special, lifetime privilege of participating with deciding vote, in all meetings of the Grand Council of the Dechema, the administration of the Max Buchner Research Institute, the Research and Advisory Bureau for Physico-Chemical Works Control and Laboratory Technique, and the Advisory Bureau for Questions on Working Materials.

Carbon Black under a Supermicroscope

At the super-microscopy laboratory of Siemens & Halske A.G. Siemensstadt, B. v. Borries and E. Ruska have developed a new supermicroscope with which it is claimed pictures of carbon black have been obtained in which the size and shape of the particles are clearly perceptible.[1] This supermicroscope is a magnetic electron microscope, and the electron rays are directed to the object from an incandescent cathode by suitable magnetic fields. The picture is thrown on to a photographic plate with the aid of two other magnetic lenses. In the carbon-black tests the slide used was a collodium membrane about 20 mμ thick. A grave difficulty that had to be overcome was to attain a sufficiently fine dispersion of the blacks before they could be put on the membrane. This problem was solved by employing ultrasonic waves on carbon black suspensions in water to which a very small quantity of a dispersion and a stabilizing agent were added.

Various types of American[2] and German blacks used in the rubber industry in addition to Royal Spectra Black, used as a pigment, were examined.

In the accompanying table the particle sizes, as indicated by the supermicroscope pictures, are given as well as the reenforcing effect, as expressed by the tensile strength and the specific insulation resistance, measured on two test compounds. For the tensile values a Buna compound was used, since in this differences in the reenforcing action of the blacks are more marked than is the case in natural rubber mixes.

Attention is called to the particle size of Thermax and P-33 which the supermicroscope shows to be about half what is usually indicated in literature for these blacks, and it is assumed that the pictures obtained in the present instance really represent primary particles.

The table shows that there is undoubtedly a connection between particle size and reenforcing action of the blacks except the acetylene blacks, but there are no simple relations between conductivity and particle size. Apparently the amount of graphite and the nature of the surfaces of the elementary particles play a more important role in conductivity than does particle size. It is intended to discuss this question in a future article.

TABLE OF VALUES

Name	Particle Size Minimum and Maximum Values	Approximate Variation Ratio	Tensile Strength Kg./Cm.²	Elongation %	Specific Resistance Ohm. Cm.
Thermax*	0.3 -0.7	1:2	80	450	10^{14}
Luv 36†	0.1 -0.4	1:4	90	500	10^{14}
P-33*	0.1 -0.2	1:2	100	480	10^{13}
Elastik‡	0.08-0.14	1:2	130	410	10^{2}
Durex 1‡	0.05-0.13	1:2.5	140	440	10^{6}
Splendor 706‡	0.04-0.09	1:2.5	150	470	10^{10}
Inca‡	0.03-0.4	1:1.3	180	390	10^{8}
Ultra Micronex¶	0.02-0.05	...	220	440	10^{5}
P 1101§	0.03-0.04	...	200	400	10^{5}
P 1250§	0.03-0.04	...	200	420	10^{4}
Anacarbon 41 284§	0.03-0.04	...	200	600	10^{4}
VN 500**	0.02-0.03	...	220	390	10^{2}
CK 3**	0.02-0.03	...	220	410	10^{2}
Royal Spectra Black#	0.01				

*Inactive American gas black.
†Inactive German black.
‡German oil black.
¶Active American gas black.
§German acetylene black.
**Active German naphthaline gas black.
#American gas black.

[1] "Carbon Black Investigations with the Supermicroscope." H. Heering, I. v. Gizycki, and A. Kirseck, *Kautschuk*, May, 1941, pp. 55-62.
[2] In the booklet entitled "The Particle Size and Shape of Colloidal Carbon as Revealed by the Electron Microscope", issued last year by the Columbian Carbon Co., the particle size of Micronex was indicated to be about 30mμ. EDITOR'S NOTE.

GREAT BRITAIN

I. R. I. Activities

The annual general meeting of the Institution of the Rubber Industry was held in London on June 11, when Sir Walrond Sinclair was reelected president for 1941-42. Sir Walrond now occupies a very important position in the rubber industry, and it was felt that it would be a great advantage to have him as president again at the present time.

The Midland Section began its summer papers program on June 9 at Birmingham with a "Short Papers Night" when the following papers were read: "Thiokol", by T. G. Crane; "The Camera and Tire Performance Problems", E. S. Tompkins, and "Some Chemical Derivatives of Rubber", by F. A. Jones.

The Manchester Section recently held its annual meeting, and, owing to the present abnormal conditions, the entire old committee was reelected. A series of short discussions took place on a variety of topics, as follows with the name of the member introducing each subject: "What Advantages Are to Be Gained from Internal Mill Mixing Compared with Open Mill Mixing? (a) From an Economic Point of View; (b) From a Quality Point of View," E. H. Hurlston (Dunlop Rubber Co., Ltd.); "Will Cold Curing Be Replaced Entirely by Dry Heat Curing?" W. N. Lister (J. Mandleberg & Co., Ltd.); "Has Synthetic Rubber a Future?" W. J. S. Naunton (Imperial Chemical Industries Ltd.); "Could the British Rubber Industry Carry on in Wartime if Imports Were Restricted to Raw Rubber and Carbon Black?" J. H. Carrington (Anchor Chemical Co., Ltd.); "Why Have the Uses of Latex not Developed as Rapidly as Was Anticipated?" A. Whitehead (Rubber Latex, Ltd.); "What Are the Uses of Synthetic Resins in the Rubber Industry?" J. G. Robinson (Ferodo, Ltd.); "Which Is the Best Type of Accelerator to Use in Ebonite?" B. L. Davies (United Ebonite & Lorival, Ltd.).

It is planned to arrange two more technical meetings before the summer ends.

Notes

The efforts of the United Kingdom to eliminate all imports not absolutely essential and to reduce others as far as possible will not be without their effect on rubber compounding practice. Rubber manufacturers have been urged to make greater use of domestic materials, such as various types of clay, whiting, Biddeford Black, slate flour, etc., and it is suggested that mixes should be revised so as to reduce consumption of imported materials and replace them with home-produced ingredients. It is pointed out that even minor changes which curtail consumption of an ingredient by only a few per cent., will in the aggregate, however, effect considerable savings.

Wilfred E. Redfern, chairman of Redfern's Rubber Works, has resigned and has been succeeded by his youngest brother, J. Arthur Redfern. The retiring chairman had started the company in 1900 with a capital of £5. Soon his brothers joined him, and the enterprise prospered until now it is a £240,000 concern, which produces besides rubber heels, its first line, a wide variety of molded and extruded rubber and ebonite goods.

The Ministry of Transport has requested that six miles of classified roads in the center of St. Helens be equipped with reflecting lenses in rubber pads. Warrington already has 22 miles of classified roads which have these lenses in their surface.

New among wartime goods are anti-gas capes and hoods made of cream-colored, rubber-proofed material. The hood is large enough to go over a gas mask.

A first attempt has been made to regularize working conditions in the rubber industry. The National Joint Industrial Council for the Rubber Manufacturing Industry has completed an agreement covering wages and general conditions. Arrangements will be made for the extended employment of women in the rubber industry for the duration of the present war.

The Goodyear Tire & Rubber Co. (Great Britain) for 1940 reported profits of £161,800 against £207,234. Dividends 5% were declared on the ordinary shares in April, in June, and in October, against 15%, 5%, and 5% respectively the year before, in addition to 4½% on preference shares, leaving £276,818 to be carried forward, as compared with £273,018 in the preceding year.

Dunlop Rubber Co., Ltd., Fort Dunlop, Birmingham, reported for 1940 a net profit of £1,259,975, after providing £1,741,880 for taxes, but before transferring £650,000 for income tax reserve for 1941 and 1942. Net profit in 1939 amounted to £1,825,659.

RUMANIA

Recent events in the Balkans have brought serious problems for Rumania's rubber industry, which must stretch available supplies of crude and old rubber to the utmost. During the first 10 months of 1940 crude rubber imports increased to 1,391 tons from 1,165 tons in the same period of 1939, but scrap rubber arrivals fell from 307 to 90 tons. At the same time tire imports decreased from 9,086 units in the 10-month period of 1939, to 6,271 units in the 1940 period, while imports of tubes sank from 6,777 to 541 units, in the face of increasing motor traffic. It is estimated that Rumania needs about 100,000 tires annually. The two local tire factories, Banloc and Fabrica de Cauciuc Brasov, between them could supply the greater part of these tire needs, but the 3,500 to 4,000 tons (including scrap rubber) required are not available.

The shortage of rubber has become more and more acute; at first it was attempted to meet the situation by blocking 50% of the available crude rubber and 75% of the scrap rubber stocks, and reserving these amounts for defense purposes, but this has not proved satisfactory. It has, therefore, been decided to enforce a 30% restriction in private consumption of crude rubber. Furthermore it is forbidden to convert old tires and tubes into sandals, mats, and similar goods without special permits from the War Ministry, which is also to regulate the purchase of old rubber.

In view of the crude rubber situation, the production of synthetic rubber is being studied. The necessary raw materials are to be found in abundance in Rumania, and it has been figured that a capital of 5,000,000 lei and annual government subsidies of 15,000,000 to 20,000,000 lei would be needed to establish and operate a synthetic rubber factory here.

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FAR EAST

MALAYA

Chermang Development, Ltd., and Budgrafts

Chermang Development, Ltd., is a unique undertaking formed in 1930 by a group of rubber companies which wished to grow budgrafts, but had no suitable reserve land available for the purpose. So they jointly acquired 3,645 acres of jungle land in the comparatively undeveloped State of Pahang and began to plant the then best clones. At present 1,500 acres have been planted with a variety of clones, several of which, incidentally, are no longer considered first class. Most of the planted area is now in tapping, 1,021 acres were tapped throughout 1940. The company is, therefore, one of the comparatively few tapping large budded areas on a commercial scale, and its experience, as given in its report for 1940, is worth considering.

In view of the clones used, it is not surprising to learn that several proved rather disappointing. The report states that BD 5, SR 9, AV 256 and 86, and P. B. 183 have fallen behind in production, but it is thought that they may be merely slow and will pick up later on. Others have come up to expectations including the classic TJ 1, which yielded 1,144 pounds per acre, Glenshiel 1, 1,127 pounds per acre, and PB 186 and 86, each of which produced 900 pounds per acre.

The company experienced a shortage of skilled labor and, to get the crop with the existing force, adopted a system of tapping which, although generally considered suitable for buddings of the age of the Chermang trees, was more intensive than the directors would have desired. The result was a marked increase in the incidence of brown bast so that a milder system will have to be adopted.

While yields on Chermang appear satisfactory enough on the whole, planters who have always been skeptical about budgrafts—and there are still a surprising number of them in Malaya—will not fail to point to the high degree of sensitivity to brown bast displayed by the most productive trees.

The company booked net profits of $120,745 (S.S. currency) and distributed its first dividend, which came to 10%.

Molded Rubber Buckets

Following a large-scale test over several years, the F.M.S. Sanitary Board has given full approval of molded rubber buckets for sanitation purposes. These buckets, made by the Kinta Rubber Works after a process patented by the owner, Mr. Hodges, are of a tough rubber compound reenforced with coconut fiber and have a rim of several steel bands set in a rubber compound. Two hundred buckets were tested, and after 4½ years' use 95% were still hygienic and serviceable. These buckets offer several advantages over similar metal ones: they are lighter, noiseless, easy to clean, do not lose their color, are unaffected by sewage, and are odorless after use; they have no jagged edges to injure laborers, and there is no wear and tear on lorry floors or washing places. Finally they are very durable. The Kinta Sanitary Board has saved $5,000 by their use, and the Medical Department has recommended their adoption throughout the F.M.S.

Exports

The exportable allowance for Malaya for the first quarter of 1941 was 162,000 tons, but for the first time since the introduction of the present restriction scheme, she failed to produce her quota. Actual output came to 136,719 tons, or about 16% below quota. About two-thirds of the total came from estates of 100 acres and over, and the remainder from small holdings and estates of less than 100 acres. Exports for the first quarter were 140,170 tons, or about 13½% less than the allowance. Even after the excess exports brought forward from 1940 have been included, a shortage of 3,424 tons remains.

Shipping difficulties and labor trouble were reported as the

main causes of the shortage in exports and production. Sporadic labor trouble has been experienced in Malaya for some time now, but has nowhere been serious except in Selangor where about 7,000 laborers on various estates struck. There was considerable intimidation by groups of strikers, and five deaths were reported before the strikes were finally put down.

Basic wages for coolies have remained unchanged for some time, but temporary allowances have been granted to meet the increased cost of living. Apparently the laborers still think their pay inadequate, although producers are inclined to find the cause of the disturbances in subversive activities by some labor leaders.

NETHERLAND INDIA

To Increase Rubber Output

The increase of the exportable allowance to 100% places a problem of production before many planters, especially those who have undertaken more or less extensive replanting. Experimentation with new tapping systems is therefore on planting programs throughout the Far East.

In recent issues of the *Bergcultures* "high tapping" is discussed as a means of solving the problem to increase output.

D. Nieuwpoort describes the work conducted since 1935 in this direction on the estates of Java with which he is connected. After considerable testing a method was developed in 1940 considered good enough for large-scale adoption. By this the trees are divided into two panels, each one meter long. The first panel starts at a height of 1.10 meters above the ground, reaching down to within 10 centimeters of the ground; the second is at the left of the first and one meter higher so that the maximum tapping height is 2.10 meters. Tapping was at first carried out over one-half the circumference every three days, but in the second half of 1940 it was changed to one-third the circumference every other day. This method was used on 233 hectares consisting of 10 different plots planted with various buddings as well as ordinary seedlings and buddings mixed, ranging in age from seven to 14 years. The average yield for the year was 954 kilos per hectare. On the largest of the plots the yield was 1140.8 kilos per hectare, and no more brown bast was noted here than on the estates as a whole.

Mr. Nieuwpoort adds that with proper care in tapping, prevention of black stripe and moldy rot, and stimulation of bark renewal, the trees do not suffer by this method. He feels it can be recommended as a permanent tapping system. The experiments also revealed that while the latex from the upper panel has a higher rubber content, the lower panel yields so much more latex than the upper that in the end it gives the most rubber despite its disadvantage in regard to the rubber content of its latex.

The manager of the Badek Estate discusses a different system on which he has been working, is primarily intended to be used on old seedling rubber. In this case tapping is carried out at the usual height for one month and in the next month at a height of three meters above the ground. He claims that yields from the upper part of the trunk are at least equal to those from lower cuts. The system, started on the Badek Estate, is also being tried out by various other companies.

Pliofilm for Packing Tea

The necessity of replacing aluminum by other suitable material has presented a problem to the tea industry here which uses aluminum foil for packing. The West Java Experiment Station tested various materials to find an adequate substitute, and Pliofilm alone proved satisfactory on all counts. Pliofilm is not much more expensive than aluminum foil, and tea packed in it remains dry and retains all its good qualities. Some buyers objected that Pliofilm, unlike aluminum foil, has no further value after it has been used, but this deficiency is not considered serious, and the Experiment Station is urging tea estates to test the material for packing purposes.

Editor's Book Table

BOOK REVIEWS

"Profitable Publicity." Henry F. Woods, Jr. Published by Dorset House, Inc., 55 W. 42nd St., New York, N. Y. 1941. Cloth, 5½ by 7½ inches, 208 pages. Price $2.50.

Accepting the importance of publicity as a basic premise, the author, himself a publicist of experience, describes the techniques used in publicity; the writing of the publicity story, its distribution to editors, the use of photographs, and finding the publicity angle in events that are not news-worthy in themselves. The appendix contains a list of news, feature, and picture syndicates and a list of trade periodicals.

"Foreign Commerce and Navigation of the United States for the Calendar Year 1939." United States Department of Commerce, Bureau of Foreign and Domestic Commerce, Washington, D. C. 1940. Cloth, 9 by 11½ inches, 850 pages. Indexed. Price $2.25. For sale by the Superintendent of Documents, Washington.

Comprehensive statistical tables for 1939 on imports and exports by articles, countries, and customs districts are presented in this annual report of the foreign commerce of the U. S. Summary tables compare 1939 with previous years back to 1921. Detailed figures on imports and exports of rubber and rubber products and the exports of rubber compounding materials are included.

NEW PUBLICATIONS

"Porter Better Built Process Equipment." H. K. Porter Co., Inc., 4992 Harrison St., Pittsburgh, Pa. 28 pages. This indexed catalog describes mixing, grinding, and processing machines such as agitators, blenders, mixers, digesters, kettles, and ball and pebble mills. Much of the equipment is made in laboratory unit sizes as well as large production sizes. A laboratory mixer suitable for rubber cement is pictured on page 14.

"The Du Pont Magazine." Midsummer, 1941. E. I. du Pont de Nemours & Co., Inc., Wilmington, Del. 24 pages. The featured article in this issue. "Vital to Defense" by William S. Dutton, discusses the history and applications of neoprene and reveals the rapid growth of neoprene production since the start of the war.

"What Will Peace Bring?" No. 40 in a series of booklet-editorials. Farrel-Birmingham Co., Inc., Ansonia, Conn. 18 pages. Problems which will face America when the war is over will include price readjustment, a continuance of the trend toward centralized government, and the development of the United States into a great world empire, possibly in conjunction with Great Britain, according to the forecast contained in this booklet, which also discusses the opportunities of America in the post-war period.

"Eastman Organic Chemicals. List No. 32, 1941." Eastman Kodak Co., Rochester, N. Y. 140 pages. Included in this catalog of over 3,400 different laboratory chemicals are about 150 items which are covered for the first time. Prices and melting or boiling points are given.

"Baldwin Southwark." First Quarter, 1941. Baldwin Southwark Corp., Philadelphia, Pa. 24 pages. "Stokes Rubber", an illustrated article by W. J. B. Stokes II published in this issue, discusses briefly methods of fabricating hard rubber: simultaneous molding and vulcanizing, pre-forming, partial curing, and then completing the vulcanization out of the press; and hand fabrication before vulcanization.

"The Vanderbilt News." Vol. 11, No. 4, July-August, 1941. R. T. Vanderbilt Co., 230 Park Ave., New York, N. Y. 30 pages. The fourth article of the series "X-Ray Studies of Rubber" by George L. Clark and Robert L. LeTourneau, which is presented in this issue, discusses the determination of filler particle size by X-ray diffraction patterns. Kalvan and Gilder's whiting were fillers in two of the vulcanizates investigated, and it is reported that Kalvan particles were found to be about 100 times smaller than Gilder's whiting particles and that Kalvan particles aline themselves in parallel formation in the rubber matrix when the stock is stretched; while Gilder's whiting particles assume a random arrangement which is unchanged by stretching the vulcanizate. Kalvan is treated in some manner in every article in the issue, and tables and graphs illustrate such properties as heat resistance, tear resistance, water marking, flex cracking resistance, recovery, adhesion to steel, etc., when Kalvan is used as a filler; six pages indicate the possibilities of the conservation of crude rubber by using Kalvan.

"List of Inspected Electrical Equipment." May, 1941. Underwriters' Laboratories, Inc., 207 E. Ohio St., Chicago, Ill. Equipment listed herein has been examined with regard to fire and accident hazards and conforms with the provisions of the National Electrical Code applying to its installation and use. The list is revised semi-annually and includes all listings up to May 1, 1941.

"Earnings in the Manufacture of Rubber Products. May 1940." United States Department of Labor, Bureau of Labor Statistics. Washington, D. C. 1941. 36 pages. Covering a recently completed wage survey in the rubber products manufacturing industry, this report by the Department of Labor details the earnings of workers in the tire and tube industry, the boot and shoe industry, and the rubber goods industry other than these two divisions. Information regarding hourly earnings, weekly hours paid for, and weekly earnings, by sex of worker and class of work, is given.

"Research—A National Resource. II. Industrial Research." Report of the National Research Council to the National Resources Planning Board. Price $1.00. For sale by the Superintendent of Documents, Washington, D. C. 370 pages. This report, which emphasizes the importance of research in modern American industry, recommends that large industries which do little research expand their research facilities and that companies adopt liberal publication policies regarding the findings of their research staffs. Brief accounts of the research activities of the B. F. Goodrich Co. and the United States Rubber Co. are given.

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"The Royle Forum." No. 15. John Royle & Sons, Paterson, N. J. 8 pages. A major portion of this special "Defense Number" is devoted to brief descriptions of the parts played by extruders, wire insulating machines, circular looms, stock screws, etc., in the national defense program. The importance of such equipment to the Army and the Navy is emphasized.

"Oak Hytex Balloons." Catalog No. 412. The Oak Rubber Co., Ravenna, O. 48 pages. The majority of the balloons shown in this colored catalog are, of course, designed to captivate children. A host of Disney characters, "Superman", and other popular childhood figures are represented in balloons. Other balloons display the emblems of lodges and fraternal organizations.

"Directory of Waste Trade, Chelsea, Mass." Chelsea Chamber of Commerce, Waste Material Council. 17 pages. This mimeographed list gives names of companies, addresses, telephone numbers, products, and average number of employes. Several companies dealing in waste rubber are included.

"For Fire Use." Walter Kidde & Co., Bloomfield, N. J. This wall card gives brief instructions on how to fight gasoline, oil, paint, wood, rubbish, and electrical fires with carbon dioxide, foam, carbon tetrachloride, and water extinguishers and tells when each type should and should not be used. The necessary maintenance required by each unit is also described.

"The Use of Ability and Aptitude Testing in Business." The Personnel Institute, Inc., 225 N. Wabash Ave., Chicago, Ill. 16 pages. The Institute's system of personnel evaluation as an aid in eliminating wasted man power and increasing business efficiency is briefly explained in these pages, as contrasted to what is termed the "advertise, interview, and hope" method of selecting employes. Contrasting charts for various workers illustrate how the system is applied.

"Inventory Control Methods." Policyholders Service Bureau, Metropolitan Life Insurance Co., One Madison Ave., New York, N. Y. 50 pages. This report, based on data contributed by a number of industrial concerns, summarizes the advantages of a formal system of inventory control and outlines six basic elements which are normally a part of a formal system. Describing practices used in controlling inventories of direct materials, supplies, and finished goods, the report does not cover the control of work-in-process inventories, or does it apply to the merchandise control problems of retailers and wholesalers. Copies are available to executives who address the Bureau on their business stationery.

Distribution of Tires

(*Continued from page 44*)

companies due to the shifting of the sources of supply by several mass distributers.

3. The impact of competition was felt over the entire market. Not the type of outlet, but favorable costs and superior management proved the effective antidote to it. Those chains, oil companies, and others that possessed these qualities maintained or improved their positions; the others lost ground.

4. The returns point to the conclusion that tire companies, distributers, and dealers need to analyze their marketing problems more clearly, redefine their objectives and policies, and then bring every resource to bear upon accomplishing those goals.

TABLE 5. ESTIMATED UNIT SALES OF PRIVATE BRAND TIRES FOR THE YEARS 1936-1940
(000 Omitted)

	1936	1937	1938	1939	1940
Total	6,995	7,562	8,662	11,600	11,190
Chains	3,300	3,750	4,580	6,276	6,495
Oil companies	2,315	2,270	2,207	2,455	2,531
Mail order	1,150	1,272	1,605	2,028	1,573
Cooperatives	....	....	....	190	281
Miscellaneous	230	270	270	651	310

RUBBER BIBLIOGRAPHY

A METHOD FOR THE TESTING OF ADHESIVE TAPE. W. C. Geer and W. B. Wescott, *Rubber Age (N. Y.)*, July, 1941, pp. 241-47.

UP-RIVER FINE PARA VERSUS PLANTATION RUBBER. H. C. Crafton, Jr., *Rubber Age (N. Y.)*, July, 1941, pp. 248-50.

RUBBER RELIEF MAPS. B. Schlemmer, *Rubber Age (N. Y.)*, July, 1941, pp. 251-52.

SOME DATA ON CHICLE AND JELUTONG. *Rubber Age (N. Y.)*, July, 1941, p. 252.

X-RAY STUDIES OF RUBBER. III. G. L. Clark, *Rubber Age (N. Y.)*, July, 1941, pp. 255-57.

RUBBER SPECIFICATIONS. Standardized Tests for Determining Service Life. D. T. Bradley, *Product Eng.*, July, 1941, pp. 372-73.

REPAIR OF FACIAL DEFECTS WITH PROSTHESIS USING A LATEX COMPOUND. A. H. Bubulian, *J. Amer. Dental Assn.*, Apr., 1941, pp. 559-71.

IMPROVED TECHNIC FOR PROSTHETIC RESTORATION OF FACIAL DEFECTS BY USE OF LATEX COMPOUND. A. H. Bulbulian, *Proc. Staff Meet., Mayo Clin.*, 14, 433-39 (1939).

PROSTHETIC RESTORATIONS OF FACIAL DEFECTS BY USE OF LATEX COMPOUND: Further Detailed Description of Technic Used. A. H. Bulbulian, *Proc. Staff Meet., Mayo Clin.*, 14, 721-27 (1939).

SYNTHETIC RESINS AND SYNTHETIC RUBBER. P. O. Powers, *News Edition (A. C. S.)*, July 10, 1941, pp. 750-51.

RUBBER RECLAIMING. *Chem. & Met. Eng.*, June, 1941, pp. 112-15.

SYNTHETIC RUBBERS. III. H. Barron, *Rubber Age (London)*, June, 1941, pp. 93-6.

ESTIMATING TIRE LIFE AND DURABILITY. P. Grodzinski, *Rubber Age (London)*, pp. 97, 102.

INDIA'S RUBBER INDUSTRY. *Rubber Age (London)*, June, 1941, p. 100.

RUBBER FOOTWEAR EXPORTS. *Rubber Age (London)*, June, 1941, pp. 101-102.

STANDARDIZATION INCREASES PRODUCTION. E. Morris, *India-Rubber J.*, June 7, 1941, pp. 5-8.

SALESMANSHIP AND THE RUBBER INDUSTRY. V. *India-Rubber J.*, June 7, 1941, pp. 10-11; VI. June 21, pp. 10-11.

THE APPLICATION OF LATEX TO HIGHWAY AND FLOOR SURFACING. W. G. Wren, *India Rubber J.*, May 31, 1941, pp. 3-4, 8. (Conclusion.)

REPORT OF THE CRUDE RUBBER COMMITTEE. *Rubber Chem. Tech.*, Apr., 1941, pp. 289-99.

THE INVESTIGATION OF SYNTHETIC LINEAR POLYMERS BY X-RAYS. C. S. Fuller, *Rubber Chem. Tech.*, Apr., 1941, pp. 323-41.

VISTANEX POLYBUTENE—RUBBER BLENDS. S. Longman, *Rubber Chem. Tech.*, Apr., 1941, pp. 386-97.

PERMEABILITY OF ELASTIC POLYMERS TO HYDROGEN. T. P. Sager, *Rubber Chem. Tech.*, Apr., 1941, pp. 444-48.

R.A.B.R.M. HARDNESS METER. J. R. Scott and R. G. Newton, *Rubber Chem. Tech.*, Apr., 1941, pp. 514-19.

"VITAL TO DEFENSE." W. S. Dutton, *Du Pont Mag.*, Midsummer, 1941, pp. 1-6.

THE PERFORMANCE OF IMPORTED CLONES. IV. C. E. Ford. Rubber Research Scheme (Ceylon), Third Quarterly Circular for 1940, Sept., 1940, pp. 201-27.

SOME ASPECTS OF THE MANURING OF MATURE RUBBER. L. A. Whelan, Rubber Research Scheme (Ceylon), Third Quarterly Circular for 1940, Sept., 1940, pp. 228-38.

CHLORINATED RUBBER, an Outline of Its Development and Application, with References to German Patent Literature. C. Philipp, *Gummi-Ztg.*, Mar. 21, 1941, pp. 247-48. (Conclusion.)

THE MANUFACTURE OF SHOE SOLES AND OTHER VULCANIZATES WITH IMPROVED ADHESION. M. Rachner, *Gummi-Ztg.*, Mar. 28, 1941, pp. 267-68; Apr. 4, pp. 290-91.

REPAIRING RUBBER FOOTWEAR. *Gummi-Ztg.*, Apr. 25, 1941, pp. 347-48; May 2, pp. 365-68.

CONSIDERATIONS OF THE MECHANICS OF THE PNEUMATIC TIRE. R. Ariano, *Kautschuk*, Apr., 1941, pp. 43-50.

TESTING DEVICE FOR THE HEAT CONDUCTIVITY NUMBER OF SYNTHETICS. W. Koch, *Kunststoffe*, Apr., 1941, pp. 135-38.

MECHANICAL-TECHNOLOGICAL TESTING OF THIN-WALLED DIPPED GOODS. P. Kluckow, *Kautschuk*, May, 1941, pp. 62-64.

A SUPER-MICROSCOPE FOR 220 KV RAY VOLTAGE. H. O. Muller and E. Ruska, *Kolloid-Z.*, Apr., 1941, pp. 21-25.

VISCOSITY AND MOLECULAR WEIGHT OF CHAIN POLYMERS. K. H. Meyer, *Kolloid-Z.*, Apr., 1941, pp. 70-74.

Patents and Trade Marks

APPLICATION

United States

2,241,391. **Pulley** with Driving Surface Having a Thin, Coherent, and Adherent Coating of the Dried Residue of a Rubber Cement, the Coating Having a Substantially Non-Tacky Exposed Surface. A. E. Bollinger, York, Pa., assignor to Minnesota Mining & Mfg. Co., St. Paul, Minn.

2,241,395. **Slitting Machine** with Sheet Feeding Drive Using a Rubber Ring. G. H. Egling, San Jose, Calif., assignor to American Can Co., New York, N. Y.

2,241,408. **Mounting** for Vibratory Body. H. C. Lord, assignor to Lord Mfg. Co., both of Erie, Pa.

2,241,409. **Shock Absorber.** R. C. Mason, Tulsa, Okla., assignor of $\frac{1}{8}$ to C. Egan, Washington, Pa.

2,241,433. **Abrasive Grinding Disk** Comprising a Rigid Backing Plate and a Plurality of Bonded Abrasive Segments Adhesively Attached by means of an Intermediate Layer of Polychloroprene, the Joints between the Opposing Side Faces Being Filled with a Cold-Setting Resin Cement. A. W. Walker, assignor to Carborundum Co., both of Niagara Falls, N. Y.

2,241,444. **Respirator Jacket** for Chest and Abdomen. J. H. W. Bower, Toronto, Ont., Canada.

2,241,472. **Nasal Filter** for Disposition in a Nostril. B. Nemon, St. Louis, Mo.

2,241,535. **Apparatus for Delivering and Permitting Normal Breathing** of Mixtures of Gases. W. M. Boothby, A. H. Bulbulian, and W. R. Lovelace, Rochester, Minn.

2,241,561. **Bridging Plug** for Wells with Yieldable Packing Sleeve. L. Spencer, assignor to Lane-Wells Co., both of Los Angeles, Calif.

2,241,593. **One-Piece Safety Tire and Tube Construction.** C. U. Gramelspacher, Jasper, Ind.

2,241,639. **Engine Starter** with Frictionally Engaging Rubber Ring. J. W. Fitz Gerald, assignor to Briggs & Stratton Corp., both of Milwaukee, Wis.

2,241,685. **Roller Skate Wheel** with Resilient Tire. R. R. Ware, assignor to Chicago Roller Skate Co., both of Chicago, Ill.

2,241,686. **Resilient Guard** for Roller Skate Wheel. R. R. Ware, assignor to Chicago Roller Skate Co., both of Chicago, Ill.

2,241,733. **Sled** with Rubber Sheathed Hand Rail. D. O. Perry, Washougal, Wash.

2,241,736. **Ear and Brow Muff** with Elastic Band. R. P. Reinemer, Circle, Mont.

2,241,758. **Automatic Valve** for Hose Nozzles. J. J. Baldine, Hubbard, O.

2,241,827. **Vehicle Spring Suspension** Utilizing a Pair of Rubber Disks. K. Rabe, Stuttgart, assignor to Dr. ing. h. c. F. Porsche, K.-G., Stuttgart-Zuffenhausen, both in Germany.

2,241,876. **Flexible Backed Brush.** E. Cohen, Manchester, England.

2,241,901. **Hosiery** Incorporating an Elastic Thread. R. E. Davis, assignor to W. B. Davis & Son, Inc., both of Fort Payne, Ala.

2,241,926. **High-Pressure Hose Coupling.** J. V. Ryan, Beacon, N. Y., and E. S. Davis, Newtown, Conn., assignors to New York Rubber Corp., New York, N. Y.

2,241,947. **Bottle Drier** Utilizing Elastic Sheet Material for Wiping Bottles. A. W. Goodwin, Oswego, Kans.

2,242,088. **Bedpan Cushion** with Elastic Retaining Members. A. Rainboth, Montreal, P. Q., Canada.

2,242,212. **Springing for Railway Trucks** Including Live Rubber Cushions. F. W. Hankins, assignor to Pennsylvania Railroad Co., both of Philadelphia, Pa.

2,242,216. **Coupling** with a Resilient and Deformable Drive Element. H. T. Kraft, assignor to General Tire & Rubber Co., both of Akron, O.

2,242,256. **Bottle Cap** with Chlorinated Rubber Facing. C. E. McManus, Spring Lake, N. J., assignor to Crown Cork & Seal Co., Inc., Baltimore, Md

2,242,420. **Bathing Cap** Comprising an Inner Skull Cap and an Outer Molded Wig Portion with an Air Chamber Between. T. C. Di Giovanna, Brooklyn, N. Y.

2,242,421. **Refrigerator Cabinet Lid.** H. M. Dodge, Wabash, Ind., assignor to General Tire & Rubber Co., Akron, O.

2,242,543. **Swab Device** with Elastic Band Section M. R. Phipps, Waterloo Township, Iowa.

2,242,561. **Never-Slip Corset Holder.** M. G. Walz, San Antonio, Tex.

2,242,569. **Rubber Tire Valve Stem.** J. C. Crowley, Cleveland Heights, assignor to Dill Mfg. Co., Cleveland, both in O.

2,242,582. **Fuel Pump** with Synthetic Rubber Diaphragm. S. Jencick, Chagrin Falls, assignor of 2/5 to L. L. Williams, Cleveland Heights, both in O.

2,242,686. **Package** Including a Gas Retaining Liner of Thin Stretchable Rubber and Rigid Reenforcing Members. L. L. Tirrell, Eau Claire, Mich.

2,242,708. **Sponge Rubber Fly** for Fishing. R. D. Lancaster, Ashtabula, O.

2,242,725. **Inner Spring-Wound Toy Ball.** J. Smithwick, Asheville, N. C., assignor, by mesne assignments of ¼ to M. D. Pickens, Arlington, Va., ¼ to F. D. Stephens, Washington, D. C., and ½ to W. T. Kniesner, Larchmont, N. Y.

2,242,737. **Paper Holding Board** with Elastic Band Retaining Means. T. H. Alfreds, Park Ridge, Ill.

2,242,746. **Automobile Body Window Assembly** with Rubber Channel Member. R. H. Dean, assignor to Ternstedt Mfg. Co., both of Detroit, Mich.

2,242,773. **Rail Cushioning and Fastening Means.** W. S. Boyce, assignor to Colorado Fuel & Iron Corp., both of Denver, Colo.

2,242,788. **Safety Inner Tube.** A. Marks, Youngstown, O.

2,242,847. **Rubber Sleeve Protector** for Earth Boring Drills. H. J. Butcher and R. W. Lunn, assignors to Leyland & Birmingham Rubber Co., Ltd., all of Leyland, England.

2,242,852. **Tandem Wheel Truck Structure** with Rubber Sleeve. H. F. Flowers, Findlay, O.

2,242,869. **Mop** with Rubber Cup. M. R. Phipps, Waterloo Township, Iowa.

2,242,915. **Multiple Resilient Wheel** of One-Piece Construction. C. D. Koski, assignor of ½ to J. A. Kaneski, both of Minneapolis, Minn.

2,242,941. **Shoe Bottom Construction.** C. H. Daniels, Greenwich, Conn., and R. I. Wood, Mansfield, Mass.; Wood assignor to Daniels.

2,243,019. **Toy Vacuum Cup Rubber Ball Catcher.** H. Singer, assignor of ½ to J. R. Leach, Honolulu, Hawaii.

2,243,106. **Lamp** for Bulb Changer Utilizing a Suction Cup with Gripping Surface. R. J. Limbert, Conshohocken, assignor to Suction Cup Lamp Changer Co., Scranton, both in Pa.

2,243,220. **Apparatus for the Application of Coating Compositions** Including a Hose Having an Inner Layer of a Plastic Polymer of 2-Chloro-Butadiene-1, 3, an Intermediate Layer of Cotton Threads Embedded in Rubber, and an Electrical Resistance Wire Wound Next to the Rubber Layer and Means for Supplying Electrical Energy to the Wire in Amount just Sufficient to Maintain the Temperature of a Liquid Passing through the Hose and Spray Gun at between 160 and 200° F., and a Heavy Outside Layer of Rubber over the Resistance Wire. E. C. Pitman, Lincroft, N. J., assignor to E. I. du Pont de Nemours & Co., Wilmington, Del.

2,243,229. **Vehicle Brake.** F. J. Tarris, Silvertown, assignor to India Rubber, Gutta Percha & Telegraph Works, Co., Ltd., both of London, England.

2,243,255. **Seal with Flexible Sleeve.** H. T. McDonald, assignor to Caterpillar Tractor Co., San Leandro, Calif.

2,243,286. **Flexible Link** with Elastic Bushing. K. K. Probst, assignor to K. K. Probst and J. K. Shoemaker as joint trustees for Probst Shoemaker-Merrill Co., all of Detroit, Mich.

2,243,327. **Blood Transfusion Apparatus.** W. B. Cooksey, Detroit, Mich.

2,243,353. **Dust Bag** for Suction Cleaners with Laminated Portion Bonded with Rubber Cement. E. F. Martinet, Cleveland, and H. Van Schoor, Shaker Heights, assignors to P. A. Geier Co., Cleveland, all in O.

2,243,356. **Sanitary Fitting** with Resilient Bushing. R. E. Olson, Pittsford, assignor to Taylor Instrument Cos., Rochester, both in N. Y.

2,243,439. **Pressure Drilling Head** with Resilient Packing. A. Pranger and S. A. Guiberson, III, assignors to Guiberson Corp., all of Dallas, Tex.

2,243,462. **Rubber Shock Absorbing Element** for Auto Bumpers. R. B. Fageol, Beverly Hills, Calif.

2,243,506. **Unitary Patch** for Repairing Rubber Article. B. V. Mitchell, Jamaica, N. Y.

2,243,529. **Colostomy Appliance.** A. Grossman and L. Jerg, both of Chicago, Ill.

2,243,620. **Game** with Elastic Line and Elastic Ball. A. del Llano y Fernandez, Habana, assignor to Zorrilla, Llano y Cia, Marianao, both in Cuba; a partnership composed of J. Zorrilla y Tarrero, A. del Llano y Fernandez, and S. Brey y Noya.

2,243,673. **Molded Drain Hose** for Washing Machines. R. Henry, Rock Island, Ill.

2,243,796. **Rubber Drum Closure.** K. F. Fay and W. L. Odenwelder, both of Easton, assignors, by mesne assignments, to Pennsylvania Salt Mfg. Co., Philadelphia County, all in Pa.

2,243,841. **Rubber Shield** for Protecting Cabinets. C. Di Bella, Philadelphia, Pa.

2,243,908. **Self-Filling Syringe.** W. Kassab, Chester, Pa.

2,243,930. **Rubber Tire Vale Stem and Check Valve** Therefore. F. H. Watson, Jonesboro, Ark., assignor to Jenkins Bros., Bridgeport, Conn.

2,243,972. **Wringer Construction.** J. Mikulasek, assignor to Maytag Co., both of Newton, Iowa.

2,243,981. **Automobile Cover** with Elastic-Tightened Edge. B. Rowan, Chicago, Ill.

2,243,990. **Electric Outlet Conduit.** P. M. Thorn, New Rochelle, and A. Parlini, Woodside, L. I., both in N. Y., and Heinz Recker, Ridgewood, N. J.; Parlini and Recker, assignors to Thorn.

2,244,043. **Shoe Rest.** W. L. Baxter, Marblehead, Mass., assignor to United Shoe Machinery Corp., Borough of Flemington, N. J.

2,244,076. **Control Head Packer** with Rubber Cylinder. J. E. Moe, assignor to Gates Rubber Co., both of Denver, Colo.

2,244,135. **Packing Structure** with Flexible Sleeve. J. F. Wallace, Shaker Heights, assignor to Cleveland Pneumatic Tool Co., Cleveland, both in O.

2,244,143. **Tap Driving Chuck** with Rubber Pressure Transmitting Means. F. A. Dowler, Alameda, assignor to Pacific Electric Mfg. Corp., San Francisco, both in Calif.

2,244,246. **Notebook** with Elastic Band Member. C. L. Esterly, Cleveland, assignor to J. D. Douglass, Rocky River, both in O.

2,244,265. **Engine Starter** with Electrically Deformable Sleeve Member. Y. Sekella, Elmira, N. Y., assignors, by mesne assignments, to Bendix Aviation Corp., South Bend, Ind.

2,244,280. **Connector** for Taps, Pipes, Etc. E. Aghnides, New York, N. Y.

2,244,361. **Guard** for Screen Door Hooks Comprising a Flat Strip of Rubber. E. S. Hall, Seattle, Wash.

2,244,368. **Sleeve** with Elastic Yarn Shirring. M. Kleiman, Brooklyn, assignor to Paragon Uniform Corp., New York, both in N. Y.

2,244,445. **Golf Glove** with Elastic Back. R. N. Carson, Ross, and T. C. O'Connell, San Rafael, both in Calif.

2,244,465. **Valve Cap Holder** with Annular Cushion Members. J. L. E. Lippe, Pawtucket, R. I.

2,244,481. **Inner Tube** Having Incorporated with It a Rubber Pad with a Weight to Offset Unbalance of Wheel Assembly. E. H. Barder and C. E. Snyder, Akron, O., assignors to B. F. Goodrich Co., New York, N. Y.

2,244,503. **Inflatable Playing Ball** with Fabric Carcass and Outstanding Ridges. J. T. Riddell, Chicago, Ill.

2,244,522. **Tank Construction** Utilizing a Rigid Supporting Structure, a Layer of Rubber-Like Material, and a Masonry Wall of Brick and Cement. H. E. Fritz, Barberton, and J. R. Hoover, Cuyahoga Falls, both in O., assignors to B. F. Goodrich Co., New York, N. Y.

2,244,560. **Intestine Feeding Mechanism** Including Elastic Feed Roll. F. G. Leavenworth, Elmhurst, Ill.

2,244,633. **Resilient Wheel** for Rail Vehicles. C. Saurer, assignor to Firestone Tire & Rubber Co., both of Akron, O.

2,244,640. **Gasket.** A. G. Davis, South Merchantville, assignor to United States Gasket Co., Camden, both in N. J.

Dominion of Canada

397,048. **Trouser Protector** of Strip Rubber. J. R. Kennedy, Cobourg, Ont.

397,057. **Insulating Pipe Couplings** with a Sheet Rubber Dielectric. J. H. McGuire, Melbourne, Victoria, Australia.

397,061, 397,062, and 397,063. **Vented Nursing** Nipple. C. J. Schmid, New York, N. Y., U. S. A.

397,069. **Inhalation Device** with Porous Sponge Rubber Pad for Air Pilots. Air Reduction Co., Inc., New York, N. Y., assignee of Ohio Chemical & Mfg. Co., Cleveland, O., assignee of J. A. Heidbrink, Minneapolis, Minn., all in the U. S. A.

397,150. **Stocking** Incorporating Elastic Yarn. Textile Machine Works, Reading, assignee of A. D. Gastrich, Wyomissing, both in Pa., U. S. A.; A. D. Gastrich executrix of the estate of G. Gastrich, deceased.

397,158. **Shoe Finishing Tool** with Circular Sponge Rubber Pad. United Shoe Machinery Co. of Canada, Ltd., Montreal, P. Q., assignee of A. S. Kemp, Leicester, Leicestershire, England.

397,163. **Microporous Rubber Filtering Medium.** United States Rubber Co., New York, N. Y., U. S. A., assignee of Dominion Rubber Co., Ltd., Montreal, P. Q., assignee of A. E. Brooks, Nutley, N. J., U. S. A.

397,183 and 397,184. **Nasal Gas Mixture Breathing Apparatus.** W. M. Boothby, A. H. Bulbulian and W. R. Lovelace, co-inventors, all of Rochester, Minn., U. S. A.

397,185. **Gas Breathing Device.** W. M. Boothby, Rochester, Minn., U. S. A.

397,194. **Molded Rubber Footwear.** Rollmann, Kaufmann & Co., Société en nom collectif, assignee of E. Rollmann, both of Brussels, Belgium.

397,198. **Denture Holding Device** with Suction Rubber Tips. L. L. Shookman, Nameoli, and

W. Pieper, Granite City, co-inventors, both in Ill., U. S. A.

397,209. **Clothes Wringer Feeding Device** Including a Feed Belt. J. Dougherty, Sr., Chester, Pa., U. S. A.

397,235. **Transfusion and Venoclysis Apparatus.** Abbott Laboratories, North Chicago, assignee of E. A. Ravenscroft, Glencoe, and R. E. Jordan, Deerfield, co-inventors, all in Ill., U. S. A.

397,236. **Protecting a Surface Subjected to Abrasion** by Applying a Primer Solution, a Cold-Vulcanizing Rubber Solution, at least One Further Coat of a Primer Solution, Sprinkling with Hard and Tough Wear-Resistant Granular Material, and Applying at least One Further Coat of Primer Solution. Anti-Abradants (Proprietary) Ltd., Johannesburg, assignee of D. van der Merwe, Haarhoff, Alberton, both in Transvaal, South Africa.

397,237. **Protection of Centrifugal Pump Surface** by a Resiliently Yielding Layer. Anti-Abradants (Proprietary) Ltd., Johannesburg, assignee of D. van der Merwe Haarhoff, Alberton, both in Transvaal, South Africa.

397,293. **Undergarment** with Elastic Sections. Cooper's Inc., assignee of A. R. Kneibler, both of Kenosha, Wis., U. S. A.

397,300. **Endless Traction Belt Link** Having a Rubber Body and Metallic Inserts. Firestone Tire & Rubber Co., assignee of L. M. Kubaugh, both of Akron, O., U. S. A.

397,314. **Wringer.** Lovell Mfg. Co., Erie, assignee of L. Green, Philadelphia, both in Pa., U. S. A.

397,315. **Wringer.** Lovell Mfg. Co., assignee of W. L. Kauffman II, both of Erie, Pa., U. S. A.

397,358. **Orthopedic Footwear and Rubber Soles Therefor.** A. Fisch, Guelph, Ont.

United Kingdom

536,604. **Flexible Electric Cables.** Commercial Secretary, Ltd., and H. A. Tunstall.

536,607. **Stretchable Leather Shoes.** T. A. Clayton, (United States Rubber Co.).

536,659. **Reducing Valve.** North British Rubber Co., Ltd., and W. R. Bridgens.

536,691. **Application of Protective Coverings** of Rubber to the Propeiler Shafts of Water-Borne Craft. Soc. Italiana Pirelli.

PROCESS

United States

2,244,845. **Conveyer Belt** with Upward Concavity. J. H. Matthews, Nutley, assignor to Raybestos-Manhattan, Inc., Passaic, both in N. J.

2,244,868. **Shoes.** E. W. Dunbar, Hudson, assignor to Cambridge Rubber Co., Cambridge, both in Mass.

2,245,303. **Molded Composition Friction Bodies for Brake Linings, Etc.** Comprising Mixing Asbestos Fibers, a Heat-Convertible Potentially Reactive Synthetic Resin, and an Ester of Sugar to Produce a Relatively Dry Mass, Molding and Heat-Hardening It to Produce a Molded Body of Friction Material. J. N. Kuzmick, Clifton, assignor to Raybestos-Manhattan, Inc., Passaic, both in N. J.

2,245,310. **Undulating Artificial Fibers** Made of High Molecular Weight Polymers of a Vinyl Compound. H. I. Waterman and W. L. Johannes de Nie, both of Delft, Netherlands, assignors to Shell Development Co., San Francisco, Calif.

2,245,324. **Method of Making a Resilient Ball Harder Than Playing Standard** and Then Rolling the Ball under Pressure until It Meets Playing Standard. W. T. Brown, Short Hills, N. J., assignor to A. G. Spalding & Bros., Inc., New York, N. Y.

2,245,355. **Tire Balancing.** T. W. Mullen, Indianapolis, Ind.

2,246,149. **Continuously Applying a Rubber Insulating Material** to a Wire in an Extrusion Apparatus. E. R. Troche and L. A. Vancura, both of Baltimore, Md., and I. N. R. Morgan, New York, N. Y., assignors to Western Electric Co., Inc., New York, N. Y.

2,246,662. **Forming a Sponge Rubber Cushion** by Cutting Blocks from a Slab of Sponge Rubber, Fitting Together and Cementing in Juxtaposition upon a Seat Body to Form a Layer of Cushioning Material with Cut Surfaces of the Blocks Adhesively Contacted with the Body. J. E. Bloomberg, assignor to Milwaukee Saddlery Co., both of Milwaukee, Wis.

2,246,780. **Sponging Rubber** by Impregnating Rubber Stock with Gas in a Closed Receptacle under Pressure, at 130 to 160° F., Reducing the Pressure to Atmospheric Pressure, and Increasing the Temperature to Vulcanize the Rubber after the Gas Has Been Released. A. J. Cordrey, Chicago, Ill., assignor to Industrial Process Corp., Dayton, O.

2,247,065. **Purifying and Concentrating Natural and Artificial Rubber Dispersions** by Disposing Such Dispersions between Upright Diaphragms Permeable to Electric Current, Which Diaphragms Also Separate the Dispersions from Electrodes, Passing a Periodically Reversing Electric Current between the Electrodes through the Dispersions, Which Current Is Insufficient to Deposit Rubber from the Dispersions in a Solid State, and Continuing the Electrical Treatment until Stratified Separation of the Colloids into Superposed, Free, Floating Layers According to Specific Gravities Is Effected While Retaining the Colloidal Character of the Substances Contained in the Dispersions. W. Pauli and P. Stamberger, Vienna, Austria, assignors, by mesne assignments, to Dunlop Plantations, Ltd., London, England.

2,247,337. **Making a Rubber Article** by Preparing a Partly Vulcanized Sponge Rubber Core, Applying an Unvulcanized Rubber Cover Containing a Blowing Agent to the Core, Placing Said Assembly in a Mold and Completing Vulcanization and Blowing of the Core and Cover. H. Raflovich, Detroit, Mich.

United Kingdom

536,250. **Articles from an Aqueous Rubber Dispersion.** Dewey & Almy, Ltd., (Dewey & Almy Chemical Co.).

536,316. **Rubber Gloves.** L. Landau and Elarco, Ltd.

536,421. **Working of Rubber.** Redfern's Rubber Works, Ltd., and F. E. Brown.

536,498. **Goods of or Containing Sponge-Like or Cellular Rubber.** International Latex Processes, Ltd., S. D. Taylor, and D. W. Pounder.

536,756. **Rubber Sheeting.** Dunlop Rubber Co., Ltd., E. W. Madge, and F. T. Purkis.

CHEMICAL

United States

2,245,500. **Polyvinyl Chloride Composition** Containing as the Sole Plasticizer No More Than 5% of Elementary Sulphur. H. Rein, Leipzig, and K. Rössler, Zscherndorf, Dreis Betterfeld, assignors to I. G. Farbenindustrie A. G., Frankfurt a.M., all in Germany.

2,245,742. **Polymerizing in an Aqueous Emulsion** a Mixture of Vinyl Chloride and Vinylidene Chloride in Which the Vinylidene Chloride Is Present in Not More Than 57% by Weight of the Vinyl Chloride. C. H. Alexander and H. Tucker, Cuyahoga Falls, O., assignors to B. F. Goodrich Co., New York, N. Y.

2,246,030. **Dispersing Titanium Dioxide Pigments** in Aqueous Medium. R. W. Ancrum, Stockton-on-Tees, and A. G. Oppegaard, Eaglescliffe, both in England, assignors to Titan Co., Inc., Wilmington, Del.

2,246,315. **Making Sponge Rubber** Which Comprises Chemically Combining All the Sulphur in a Latex Compound Containing 0.15 to 0.25% Sulphur Based on the Rubber Content of the Latex, Adding Free Sulphur to the Latex and Converting It into Latex Foam, Converting the Foam into the Desired Shape and Coagulating to Form Sponge Rubber and Heating to Cause Some of the Free Sulphur to Combine with the Rubber. L. A. Murray, Jr., Passaic, N. J., assignor to United States Rubber Co., New York, N. Y.

2,246,915. **Flexible Plasticized Polyvinyl Alcohol Composition Containing** as a Thermostabilizing Agent a Soluble Haloid of Ammonium, of Alkali Metal, or of Alkaline Earth Metal. C. Dangelmajer, Nutley, assignor to Resistoflex Corp., Belleville, both in N. J.

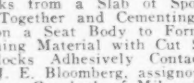
2,246,924. **Aryl-Amino Alkenyl Phenols.** P. T. Paul, Naugatuck, Conn., assignor to United States Rubber Co., New York, N. Y.

2,246,937. **Catalytic Polymerization of Diolefins** in Which Is Used as a Catalyst a Peroxide of Tetrahydro-Furfurane or Its Homologs. H. M. Guinot, Niort, assignor to Les Usines de Melle, Melle, (Deux-Sevres), both in France.

Dominion of Canada

396,924. **Softening Rubber** by Subjecting It at Temperatures of from 130 to 200° C. to the Action of 0.25 to 2% of 2-Mercapto α-Napthol Thiazole in the Absence of More Than 0.5% of Sulphur, More Than 5% of Pigment, and Enough Neutralizing Agent to Neutralize the Thiazole. Canadian Industries Ltd., Montreal, P. Q., assignee of L. L. Smith, Pennsgrove, N. J., U. S. A., executrix of the estate of C. C. Smith, now deceased, in his lifetime of Pennsgrove, and I. Williams, Borger, Tex., U. S. A., co-inventor with C. C. Smith.

396,947. **Antioxidant** Having the General Formula



Where *A* Is a Methyl Radical, *R* a Phenylene Group, and R_1 and R_2 Are Each a Phenyl Group. Dominion Rubber Co., Ltd., Montreal, P. Q., assignee of W. F. Tuley, and P. T. Paul, co-inventors, both of Naugatuck, Conn., U. S. A.

396,951. **Plastic or Coating Composition** Comprising Chlorinated Rubber or a Chlorine Containing Vinyl Resin, Subject to Light or Heat Deterioration, and as a Preventive of Deterioration a Resinous Reaction Product of a Phenol, Formaldehyde, and a Non-Aromatic Primary Amine. E. I. du Pont de Nemours & Co., Inc., assignee of E. K. Ellingboe and P. L. Salzberg, co-inventors, all of Wilmington, Del., U. S. A.

397,010. **Polymerization Products** of a Butadiene of the Formula $CH_2{=}C(R){-}C(R){=}CH_2$, Where

R Is Hydrogen or an Alkyl Group, Co-Polymerized with an Ester of an Acrylic Acid of the Formula $CH_2{=}C(R){-}COOR'$, Where *R* Is Hydrogen or an Alkyl Group and *R'* Is a Branched Chain Aliphatic Radical or an Unsaturated Aliphatic Radical, the Butadiene Being Present in Amount from 25% to 75% of the Total Monomer Treated. Polymerization Products of 1,3-Butadiene Co-Polymerized with Allyl Methacrylate. Wingfoot Corp., Wilmington, Del., assignee of A. M. Clifford, Stow, O., both in the U. S. A.

United Kingdom

532,158. **Polymerization of Diolefins.** (Synthetic.) Usines De Melle.

536,301. **Preparation of Softened Rubber.** British Rubber Producers' Research Assn.

536,313. **Treatment of Rubber.** United States Rubber Co.

536,514. **Method of Producing Thiazyl Sulphur Halides and Products Resulting Therefrom.** United States Rubber Co.

536,618. **Vulcanization of Rubber.** E. I. du Pont de Nemours & Co., Inc.

536,734. **Production of Isobutylene.** A. C. Jessup.

MACHINERY

United States

2,244,948. **Apparatus and Method for Processing Latex** into Decorative Strips. T. Hoenemann, East Providence, and H. A. Stuart, assignors to Goodyear Footwear Corp., both of Providence, all in R. I.

2,245,122. **Apparatus for Feeding and Cutting Sheet Material.** G. T. Balfe, assignor to Detroit Gasket & Mfg. Co., both of Detroit, Mich.

2,245,728. **Cutting Device** for Circumferentially Grooving Tire Surfaces. H. E. Sipe, New York, N. Y.

2,246,379. **Valve Control Mechanism** for Hydraulic Presses. W. P. Muir, Montreal, and J. H. Maude, Verdun, assignors to Dominion Engineering Works, Ltd., Lachine, all in P. Q., Canada.

2,246,463. **Treatment of Mold Surfaces** with Graphite. L. D. Garratt, New Castle, assignor to Industrial Colloids Co., Emlenton, both in Pa., a partnership consisting of H. J. Crawford, G. A. Breene, E. A. Willson, and L. D. Garratt.

2,246,531. **Apparatus for Saturating Fibrous Webbing.** K. J. Novak, Trumbull, assignor to Raybestos-Manhattan, Inc., Bridgeport, both in Conn.

2,246,860. **Tire Patch Mold.** J. R. Richards, Seattle, Wash.

2,246,917. **Apparatus and Method for Separating a Rubber Ribbon into Its Individual Threads.** R. S. Francis, Rumford, R. I., assignor to United States Rubber Co., New York, N. Y.

UNCLASSIFIED

United States

2,245,030. **Rubber-Tubing Clamp** for Intravenous Operations. B. H. and M. R. Gottesfeld, both of Denver, Colo.

2,245,101. **Hose Nipple Connection and Joint.** H. O. Cole, Holliston, assignor to Boston Woven Hose & Rubber Co., Cambridge, both in Mass.

2,245,460. **Pressure Actuated Electrical Tire Signal.** W. O. Bundy, Jr., and C. S. Lewis, both of El Paso, Tex., assignors of 33⅓% to I. Ehrlich, El Paso County, all in Tex.

2,245,529. **Refrigerator Car Floor.** J. S. Lundvall, assignor to Union Asbestos & Rubber Co., both of Chicago, Ill.

2,246,017. **Rim.** C. W. Sinclair, assignor to Kelsey-Hayes Wheel Co., both of Detroit, Mich.

2,246,081. **Display Rack for Belts.** V. Van Nattan, assignor to Gates Rubber Co., both of Denver, Colo.

2,246,102. **Tire Inflating Device.** O. L. McGrann, Omaha, Nebr.

2,246,389. **Tire Pressure Indicating System.** O. B. Skonnord, Valley City, N. Dak.

2,246,775. **Pneumatic Tire Valve.** A. O. Anderson, Chicago, Ill.

2,246,954. **Extractor for Hose Couplings.** W. O. Schleinitz, Dayton, O.

Dominion of Canada

397,109. **Tractor Wheel.** Dunlop Tire & Rubber

Goods Co. Ltd., Toronto, Ont., assignee of R. F. Daw, Birmingham, Warwickshire, England.

397,110. **Tire Display Sign.** Dyment Co., assignee of J. T. Mullen, both of Cleveland, O., U. S. A.

397,162. **Denture** of Polystyrene. United States Rubber Co., New York, N. Y., U. S. A., assignee of Dominion Rubber Co., Ltd., Montreal, P. Q., assignee of O. H. Smith, West Englewood, N. J., U. S. A.

397,164. **Asbestos Fabric Cover** for Ironing Surfaces. United States Rubber Co., New York, N. Y., U. S. A., assignee of Dominion Rubber Co., Ltd., Montreal, P. Q., assignee of B. H. Foster, Maplewood, N. J., U. S. A.

United Kingdom

536,225. **Containers** for Liquid Fuel, Etc. Dunlop Rubber Co., Ltd., E. Stanton, and G. C. Brentnall.

536,476. **Tubular Rivets, Nuts, or Like Fastenings.** Dunlop Rubber Co., Ltd., and H. Trevaskis.

536,758. **Fluid-Pressure Retaining Devices** for Pneumatic Tires. Firestone Tire & Rubber Co.

TRADE MARKS

United States

386,144. Colored parallel warp threads extending longitudinally of the hose cover and woven therein to form a broken red stripe and a continuous blue stripe at each side of the red stripe and spaced a slight distance from the red stripe by white warp threads. Hose covers. United States Rubber Co., New York, N. Y.

386,145. Colored parallel warp threads extending longitudinally of the hose cover and woven therein to form a continuous red stripe and a broken blue stripe at each side of the red stripe and spaced a slight distance from the red stripe by white warp threads. Hose covers. United States Rubber Co., New York, N. Y.

386,163. **Rubide.** Rubber chloride and rubber hydrochloride, etc. Firestone Tire & Rubber Co., Akron, O.

386,181. **Jr assembly Shop.** Clothing, shoes, accessories. Franklin Simon Co., Inc., New York, N. Y.

386,246. Representation of a rectangle containing the words: **"Non Static"** between lightning flashes. Flooring. Dunlop Tire & Rubber Corp., Buffalo, N. Y.

386,255. **Taylastix.** Shoe laces. Thomas Taylor & Sons, Inc., Hudson, Mass.

386,355. **Stet.** Water-soluble anti-freeze solution. B. F. Goodrich Co., New York, N. Y.

386,373. Representation of a label containing the words: **"National Co-op Co-operatives."** Tires, tubes, belting, packing, washers, etc. National Co-operatives, Inc., Chicago, Ill.

386,382. **Petal-fresh.** Dress shields. I. B. Kleinert Rubber Co., New York, N. Y.

386,389. **Madison Square.** Shoes. Schiff Co., Columbus, O.

386,424. **Windsmoor.** Clothing. Morris Mantles, Ltd., London, England.

386,436. **Innacush.** Tires. United States Rubber Co., New York, N. Y.

386,461. **Spareaire.** Tire inflators. W. B. O'Brien, Jr., Port Huron, Mich.

386,493. Annular band of golden yellow applied to the inner peripheral wall of the inner tube, the golden yellow being in contrast to the black body of the tube. Inner tubes. B. F. Goodrich Co., New York, N. Y.

386,559. **Calatex.** Surgical and laboratory rubber tubing. Clay-Adams Co., Inc., New York, N. Y.

386,614. Representation of a square containing the word: **"Rub'R-Shim."** Adhesive coated stripping for cushioning and waterproofing. Van Cleef Bros., Chicago, Ill.

386,629. **Out-Er-Arch.** Arch supports. Out-Er-Arch, New York, N. Y.

386,638. **Ramses.** Pessaries. Julius Schmid, Inc., New York, N. Y.

386,681. Representation of two concentric diamonds containing the word: **"Brown"** superimposed on the letter: **"R."** Sponge rubber. Brown Rubber Co., Inc., Lafayette, Ind.

386,684. Representation of a fanciful figure of a man chasing a tire. Recapped and retreaded tires. A. P. Rose, doing business as Modern Retreaders, Nashville, Tenn.

386,689. **Lilylastik.** Foundation garments. Lily of France Corset Co., Inc., New York, N. Y.

386,700. **Victory.** Tires and tubes. Pharis Tire & Rubber Co., Newark, O.

386,703. **Pliosheen.** Waterproof fabrics containing no rubber. Goodyear Tire & Rubber Co., Akron, O.

386,765. **Betteroy.** Clothing, shoes, accessories. Bloomingdale Bros., Inc., New York, N. Y.

386,784. **R. A. F.** Raincoats. Spatz Bros., Inc., New York, N. Y.

386,824. **Trans-Cord.** Belting. B. F. Goodrich Co., New York, N. Y.

386,832. **Royal Rider.** Bicycle tires. United States Rubber Co., New York, N. Y.

386,836. **Solite.** Dress shields. I. B. Kleinert Rubber Co., New York, N. Y.

386,861. **Glove-tex.** Elastic fabric for footwear inserts, etc. Thomas Taylor & Sons, Inc., Hudson, Mass.

386,874. **"Fleece-Nap."** Shower curtains, etc. I. B. Kleinert Rubber Co., New York, N. Y.

386,878. **"Tummy Gard."** Girdles. Lewel Mfg. Co., Inc., New York, N. Y., assignor to Lewel Mfg. Co., Inc., a corporation of N. J.

386,887. **Crepelastic.** Hosiery having a zone incorporating rubber yarn. Berkshire Knitting Mills, Wyomissing, Pa.

386,891. **Hi-Top.** Foundation garments. H. W. Gossard Co., New York, N. Y.

386,908. **Brashield.** Combination brassiere and dress shields. Rand Rubber Co., Brooklyn, N. Y.

386,939. **"Zip-Vest."** Corsets, etc. Dominion Corset Co., Ltd., Quebec, P. Q., Canada.

386,952. **Finnie-Boot.** Shoes. Norway Shoe Co., Norway, Me.

386,953. **Pieksu Shoe.** Shoes. Norway Shoe Co., Norway, Me.

386,972. **Country Classics.** Clothing, footwear, etc. Arnold Constable & Co., Inc., New York, N. Y.

387,014. Representation of a rectangle containing the words: **"Lumflex Soft Tread Insole."** Shoes. Lumbard-Watson Co., Auburn, Me.

387,019. **Senitex.** Carbon black. Binney & Smith Co., New York, N. Y.

387,051. **Parador.** Odorants. Givaudan-Delawanna, Inc., New York, N. Y.

387,080. **Ortho.** Vaginal diaphragms. Ortho Products, Inc., Linden, N. J.

387,092. **There Is A Maiden Form For Every Type Of Figure.** Corsets, etc. Maiden Form Brassiere Co., Inc., New York, N. Y.

387,122. **American Beauty.** Surface finishes for tire casings, molded rubber goods, and cleaning and polishing preparations for metal and coated surfaces. General Tire & Rubber Co., Akron, O.

387,230. **CB.** Insulated wire and cable. Anaconda Wire & Cable Co., New York, N. Y.

387,284. **"Keep Your Shirt On."** Wearing apparel. Rayon Corp. of America, Allentown, Pa.

387,303. Representation of a seal balancing on his nose the letter: "O" in the word: "Mil-O-Seal." Cellophane or pliofilm wrapper sheets. Milprint, Inc., Milwaukee, Wis.

387,327. Representation of an oval containing the words: **"De-Novia Beautiful A. H. Pearl."** Shoes. A. Birenbaum, doing business as A. H. Pearl and Pearl Shoe Co., Philadelphia, Pa.

387,337. Representation of a silhouette of a woman posing on a platform beneath the words: **"Posture-form."** Shoes. Stenchever's, Inc., Paterson, N. J.

387,340. **Dunnhill.** Garters, suspenders, garter belts. M. Reisman, New York, N. Y.

387,438. **"Winfrey."** Clothing. Bonwit Teller, Inc., New York, N. Y.

387,445. The words: **"California Fashion firsts"** and two women's silhouettes superimposed on a representation of an outline map of California. Clothing. H. Scheiner, Los Angeles, Calif.

387,530. Representation of two concentric diamonds containing the word: **"Friotex."** Latex. General Latex & Chemical Corp., Cambridge, Mass.

387,540. **Persuede.** Foundation garments. I. B. Kleinert Rubber Co., New York, N. Y.

387,543. **Economite.** Self-polishing wax, rubber flooring lacquer, other rubber surface lacquers. Terrazzo seal. Hall-Watson Co., Inc., New York, N. Y.

387,545. Representation of a head of a Boston bull terrier and the words: **"My Pal."** Gloves. Knoxville Glove Co., Knoxville, Tenn.

387,551. **Furnitex.** Carbon black. Binney & Smith Co., New York, N. Y.

387,552. **Neotex.** Carbon black. Binney & Smith Co., New York, N. Y.

387,587. Representation of a label, variously shaded to separate it into light and dark areas, the dark area containing a white circle enclosing the monogram: **"vb"** and the light area containing the word: **"Veri-Best."** Narrow elastic, notions, etc. John Lawrie & Sons, Chicago, Ill.

387,592. **"Quick."** Dress shields. Rand Rubber Co., Brooklyn, N. Y.

387,780. **Ramasit.** Waterproofing colloidal dispersion for textiles. General Dyestuff Corp., New York, N. Y.

387,784. **Aquaseal.** Wires and Cables. General Cable Corp., New York, N. Y.

387,798. **Kaps.** Prophylactics. Rubber Research Products Corp., Jersey City, N. J.

387,832. **Raolin.** Rubber chloride impregnated fabrics. Raolin Corp., New York, N. Y.

387,833. **Raolin.** Rubber chloride coated papers. Raolin Corp., New York, N. Y.

387,876. **Dura-Flex.** Rubber waterproofed sheeting. E. A. Riesenburger, doing business as Proven Products Co., Flushing, L. I., N. Y.

387,907. **True Blue.** Golf balls. United States Rubber Co., New York, N. Y.

387,908. **Nokrode** Battery terminal connectors. Okonite Co., Passaic, N. J.

387,929. **Mad Money.** Undergarments. Lord & Taylor, New York, N. Y.

387,945. Representation of a four-leafed clover containing the words: **"Picco"** and **"Picco"** intersecting each other. Coal-derived chemicals used in the manufacture of paints, varnishes, rubber goods, etc. Pennsylvania Industrial Chemical Corp., Clairton, Pa.

387,958. Representation of the head of an American Indian above two concentric circles containing the words: **"Penobscot Moccasin."** Footwear. Philco Shoe Corp., Bangor, Me.

387,963. **Life Stride.** Shoes. Milius Shoe Co. St. Louis, Mo.

387,964. Representation of a man sawing a log with a gigantic comb. Rubber combs. S & G Rubber Co., Inc., New York, N. Y.

387,977. Representation of a label containing the word: **"Velvetex."** Prophylactics. Julius Schmid, Inc., New York, N. Y.

387,984. **Pliosheen.** Composition containing no rubber for waterproofing fabrics. Goodyear Tire & Rubber Co., Akron, O.

387,986. **Wickburn.** Clothing, including suspenders, garters, etc. Men's Wear Sales Corp., New York, N. Y.

387,990. The words: **"Timely Styles Hand Crafted Narrow Heel"** surrounding a circle containing a coat-of-arms with the letters: **"T"** and **"S."** Shoes. Topps Shoe Corp., New York, N. Y.

388,018. **Lilees.** Foundation garments. Lily of France Corset Co., Inc., New York, N. Y.

388,056. **Squaws.** Shoes. A. Sandler Co., Boston, Mass.

388,058. **Gala-Net.** Girdles, etc. H. W. Gossard Co., Chicago, Ill.

388,060. **Pow Wow.** Shoes. Huiskamp Bros. Co., Keokuk, Iowa.

388,062. **Angela.** Foundation garments. Bestform Foundations, Inc., New York, N. Y.

388,131. **Anodizer.** Aqueous dispersions of synthetic rubber compound, both alone and in admixture with natural rubber dispersions. American Anode, Inc., Wilmington, Del.

388,136. **Lady Nettleton.** Shoes. A. E. Nettleton Co., Syracuse, N. Y.

388,140. **Wear Goodyear Master.** Footwear. Goodyear Footwear Corp., Providence, Rhode Island.

388,170. **Cole of California.** Clothing, shoes. Cole of California, Inc., Los Angeles, Calif.

388,182. **Ekko.** Molds for glass lenses, glass placques, and plastic brush backs. United States Rubber Co., New York, N. Y.

388,190. Representation of two crossed cutlases and the words: **"Miss Pirate"** superimposed on them. Shoes. Marshall, Meadows & Stewart, Inc., Auburn, N. Y.

388,202. **Super Miler.** Tires. General Tire & Rubber Co., Akron, O.

388,207. Representation of a label containing the word: **"Cosmo."** Coats, including raincoats. Cosmopolitan Mfg. Co., Cambridge, Mass.

388,245. **Peni-flex.** Shoes. J. C. Penney Co., New York, N. Y.

388,250. **Speed-Mo.** Stationery supplies, including inks for sponge rubber stamp pads. Rivet-O Mfg. Co., Orange, Mass.

388,283. Representation of a silhouette of a man leaning against a beach umbrella, and the words: **"Sea ★ Dogs."** Beach footwear. Conlin & Smith, Inc., New York, N. Y.

388,287. **Sea-Ray.** Bathing suits and caps. United States Rubber Co., New York, N. Y.

388,288. **Woodthrop.** Corsets. Woodward & Lothrop, Washington, D. C.

388,314. **Vision.** Dress shields. I. B. Kleinert Rubber Co., New York, N. Y.

388,376. **Fiberfoam.** Sponge rubber. Dayton Rubber Mfg. Co., Dayton, O.

388,377. Representation of a silhouette of a donkey kicking, and two fanciful figures, one astride the animal and the other holding its head; and the words: **"Hoolygan Kicks."** Shoes. Paramount Shoe Mfg. Co., St. Louis, Mo.

388,394. **Ropeez.** Rubber and braided fiber shoes, etc. Rope Soles, Inc., New York, N. Y.

388,412. **Lanco Debs.** Footwear, clothing, etc. Lansburgh & Bro., Washington, D. C.

388,413. **Lanco Kiddies.** Footwear, clothing, etc. Lansburgh & Bro., Washington, D. C.

388,414. **Lanco Preps.** Shoes, clothing. Lansburgh & Bro., Washington, D. C.

388,415. **Sir Lanco.** Shoes, clothing. Lansburgh & Bro., Washington, D. C.

388,434. **Style Flash Style Hall Clothes.** Clothing. Blankson Clothes, Inc., New York, N. Y.

388,436. **Cord-O-Ray.** Undergarments. Luxuray, Inc., New York, N. Y.

388,440. **"Actioneers."** Foundation Garments. I. B. Kleinert Rubber Co., New York, N. Y.

388,441. Representation of a black cat. Rubber and/or leather heels and soles. Cat's Paw Rubber Co., Inc., Baltimore, Md.

388,444. Representation of a black cat. Rubber heels and soles. Cat's Paw Rubber Co., Inc., Baltimore, Md.

388,454. **Flexspun.** Girdles, etc. Artistic Foundations, Inc., New York, N. Y.

388,456. **Dayflex.** Rubber hose and belting. Dayton Rubber Mfg. Co., Dayton, O.

388,472. **Allied.** Tires and tubes. Armstrong Rubber Co., West Haven, Conn.

388,474. **Zenith Tuf-Test.** Tires and tubes. Marshall-Wells Co., doing business as Zenith Rubber Co., Duluth, Minn.

Market Reviews

CRUDE RUBBER

Commodity Exchange

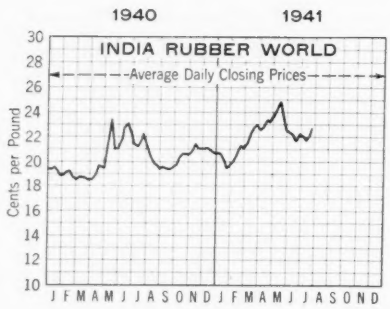
TABULATED WEEK-END CLOSING PRICES ON THE NEW YORK MARKET

Futures	May 31	June 28	July 5	July 12	July 19	July 26
July	22.12	21.05	21.10	21.15	21.30	22.10
Sept.	21.80	21.30	21.15	21.35	22.00	23.00
Dec.	21.25	21.30	21.10	21.30	21.95	22.45
Mar.	20.80	20.90	20.85	21.00	21.60	21.80
Volume per week (tons)...	6,610	1,310	830	330	820	1,480

RUBBER trading as shown by weekly volume figures has almost come to a standstill following the government action of June 23 which limited trading in the Commodity Exchange to the liquidation of open positions. Following a weak rise in most futures at the close of June, prices remained comparatively steady. December futures, after closing at 21.30¢ per pound on June 28 declined to 21.10¢ on July 2, and then strengthened to close at 22.15¢ on July 22. Thereafter the market was easier, and December futures closed at 22¢ per pound on July 30.

The price of crude rubber went up slightly following the resignation of the Japanese cabinet on July 16. This action augmented the uncertainty in the Pacific area which had already been provoked by the Russo-German war. More tension arose from Japanese penetration into southern French Indo-China later in the month.

World consumption of crude rubber averaged 95,984 long tons per month during the first four months of the current year, against an average monthly absorption of 87,922 long tons in 1940, according to statistics of the International Rubber Regulation Committee. United States consumption averaged 65,859 long tons a month for the first four months of this year, against the 1940 average monthly figure of 51,549 long tons. The average monthly rate of absorption outside of this country for the first four months of this year was 30,125 long tons, against 36,373 long tons a month last year. World shipments of crude rubber, exceeding those of previous years, averaged 125,462 long tons a month for the first four months of this year, as compared with average monthly shipments of 116,045 long tons in 1940.



New York Outside Market—Spot No. 1-X Ribbed Smoked Sheets

New York Outside Market Rubber Quotations

	July 29, 1940	June 26, 1941	July 29, 1941
Latex			
Normal and concentrated (solid content) ....*lb.*	$0.24/0.25	$0.30/0.35	$0.278
Paras			
Upriver fine....*lb.*	.18¼	.27¾	.30
Upriver fine....*lb.*	*.20½	*.29½	*.32
Upriver coarse.*lb.*	.11¾	.16	.17
Upriver coarse.*lb.*	*.18½	*.22	*.23
Islands fine....*lb.*	.18	.27	.29
Islands fine....*lb.*	*.20	*.29	*.32
Acre, Bolivian fine .....*lb.*	.18½	.28	.30
Acre, Bolivian fine .....*lb.*	*.21	*.30	*.32
Beni, Bolivian fine .....*lb.*	.19¼	.28	.30
Madeira fine...*lb.*	.18¼	.27¾	.30
Caucho			
Upper ball.....*lb.*	.11¾	.16	.17
Upper ball.....*lb.*	*.18½	*.22	*.23
Lower ball.....*lb.*	.11	.15½	.16½
Pontianak			
Pressed block..*lb.*	.20½/.25	.15/.26	.17/.26
Guayule			
Ampar .....*lb.*	15	.15½	.15½
Africans			
Rio Nuñez ..*lb.*	.18½	.19	.19
Black Kassai...*lb.*	.18½	.19	.19
Prime Niger flake .....*lb.*	.22½	.28	.28
Gutta Percha			
Gutta Siak ....*lb.*	.23	.18½	.20/.22
Gutta Soh .....*lb.*	.29	.29	.29
Red Macassar..*lb.*	1.20	1.35	1.35
Balata			
Block Ciudad Bolivar .....*lb.*	..	.47	.48/.50
Manaos block..*lb.*	.56	.50	.48
Surinam sheets..*lb.*	.62	.52	.49
Amber .....*lb.*	.68	.54	.50

* Washed and dried crepe. Shipments from Brazil.

The three major crude rubber producing territories—British Malaya, Netherlands India, and Ceylon—exported 611,533 tons during the first six months of 1941, as against 555,391 tons exported during the first half of 1940, according to figures reported by the Commodity Exchange, Inc. Under the restriction scheme, British Malaya exported 48,320 tons during June, which is 1,790 tons less than shipped in May. Permissible exports for June were 54,000 tons.

New York Outside Market

Buying rubber in the Far East and selling it to the Rubber Reserve Co. on a fixed fee basis, dealers at present are acting as agents for the government, it is reported. Small rubber manufacturers are said to be obtaining current requirements through dealers from stocks of free rubber still available. Although no announcement has been made yet, it is believed that in the future small rubber manufacturers will receive their stocks from dealers who will obtain rubber from the Rubber Reserve Co., thus making the ultimate function of the dealer one of distribution. Large manufacturers will probably obtain rubber directly from the government.

Small manufacturers interested in spot and later July arrival purchases, deferred buying while awaiting a clarification of the government rubber program.

The market was weak early last month, and No. 1-X ribbed smoked sheets in cases declined from 22¼¢ per pound on June 30 to 21½¢ on July 7. The market has strengthened since then, reaching 22½¢ on July 22. The closing price was 23¼¢ per pound on July 30, with the market stronger.

Rubber and Canvas Footwear Statistics

Thousands of Pairs

	Inventory	Production	Shipments
1938	16,183	50,812	54,942
1939	16,388	60,612	60,377
1940	11,129	57,278	62,480
1941			
Jan.	10,377	5,939	6,614
Feb.	10,754	5,543	5,166
Mar.	11,222	5,827	5,359
Apr.	12,272	6,628	5,555
May	13,223	6,084	5,134

The above figures have been adjusted to represent 100% of the industry based on reports received which represented 81% for 1936-37.
Source: *Survey of Current Business*, Bureau of Foreign & Domestic Commerce, Washington, D. C.

New York Outside Market—Spot Closing Prices—Plantation Grades—Cents per Pound

	June, 1941							July, 1941														
	23	24	25	26	27	28†	30	1	2	3	4*	5†	7	8	9	10	11	12†	14	15	16	17	18	19†
No. 1-X R.S.S. in cases	21¾	22	22¼	22½	22½	..	22¼	22¼	22	21¾	..	..	21½	21½	21¾	21⅞	21⅞	..	21⅞	21⅞	22¼	22¼	22¼	..
No. 1 Thin Latex Crepe	23	23¼	23¼	23½	23½	..	23¼	23¼	23¼	22⅞	..	..	22⅞	22⅞	23⅛	23¼	23¼	.	23¼	23¼	23⅝	23⅝	23⅝	..
No. 2 Thick Latex Crepe	23	23½	23¼	23½	23½	..	23½	23½	23¼	23⅛	..	..	23	23	23¼	23⅜	23⅜	..	23⅞	23⅞	23¾	23¾	23¾	..
No. 1 Brown Crepe	21½	21¾	21¾	22	22	..	22	22	22	20¾	..	..	20½	20½	20¾	20⅞	20⅞	..	20⅞	20⅞	21¼	21¼	21¼	..
No. 2 Brown Crepe	21¼	21½	21½	21¾	21¾	..	21¾	21¾	21¾	20½	..	..	20¼	20¼	20½	20⅝	20⅝	..	20⅝	20⅝	21	21	21	..
No. 2 Amber	21½	21¾	21¾	22	22	..	22	22	22	20½	..	..	20½	20½	20¾	20⅞	20⅞	..	20⅞	20⅞	21¼	21¼	21¼	..
No. 3 Amber	21¼	21½	21½	21¾	21¾	..	21¾	21¾	21¾	20½	..	..	20¼	20¼	20½	20⅝	20⅝	..	20⅝	20⅝	21	21	21	..
Rolled Brown	20¾	21	21	21¼	21¼	..	21¼	21¼	21¼	19	..	..	19	19	19¼	19	19	..	19	19	19⅜	19⅜	19⅜	..

*Holiday. †Closed.

IMPORTS, CONSUMPTION, AND STOCKS

United States and World Statistics of Rubber Imports, Exports, Consumption, and Stocks—Long Tons

Twelve Months	U.S. Imports*	U.S. Consumption¶	U.S. Stocks Mfrs., Dealers, Importers, Etc.†¶	U.S. Stocks Afloat	U.K.—Public Warehouses London, Liverpool†‡	Singapore and Penang Dealers and Port Stocks†‡	World Net Exports‡	World Absorption‡c	World Stocks†‡§
1939	499,616	592,000	125,800	91,095	44,917*a*	15,299	988,600	1,110,383	447,666*a*
1940	818,624	648,500	288,864	145,950	.....	26,773	1,392,538	1,069,425	.....
1940									
Jan.	72,520	58,061	139,304*b*	90,285*b*	.....	35,928	129,557	106,073	.....
Feb.	43,088	52,078	129,023*b*	112,257*b*	.....	35,563	109,178	96,755	.....
Mar.	59,277	52,454	134,871*b*	113,619*b*	.....	23,830	99,954	102,282	.....
Apr.	70,700	52,361	152,645*b*	102,557*b*	.....	42,239	110,812	100,570	.....
May	51,571	54,513	148,881*b*	109,364*b*	.....	32,731	110,704	94,988	.....
June	53,889	47,834	154,313*b*	119,138*b*	.....	32,375	109,734	78,674	.....
July	69,596	48,354	175,455*b*	139,629*b*	.....	36,716	134,159	75,427	.....
Aug.	73,028	53,307	194,760*b*	141,286*b*	.....	40,395	118,498	80,371	.....
Sept.	78,972	52,469	220,597*b*	137,888*b*	.....	29,069	124,864	77,978	.....
Oct.	74,716	59,644	235,353*b*	166,837*b*	.....	33,613	124,918	87,216	.....
Nov.	72,901	57,716	250,412*b*	158,095*b*	.....	33,778	104,390	84,352	.....
Dec.	98,366	59,709	288,864*b*	145,950*b*	.....	26,773	115,770	84,739	.....
1941									
Jan.	86,833	65,989	309,411*b*	153,169*b*	.....	37,145	152,220	96,925	.....
Feb.	73,973	62,692	320,372*b*	136,955*b*	.....	46,913	97,390	89,216	.....
Mar.	87,123	69,024	338,147*b*	140,228*b*	.....	41,026	130,395	98,521	.....
Apr.	63,305	71,374	329,767*b*	153,484*b*	.....	42,085	122,841	104,074	.....
May	101,404	71,365	359,234*b*	147,459*b*	.....	.....	.....	.....	.....
June	65,093	84,912	339,108*b*	175,499*b*	.....	.....	.....	.....	.....

*Including liquid latex. †Stocks on hand the last of the month or year. ‡*Statistical Bulletin of the International Rubber Regulation Committee.* §Stocks at U. S. A., U. K., Singapore and Penang, Para, Manaos, regulated areas, and afloat. ¶Corrected to 100% from estimate of reported coverage. *a* Stocks as of Aug. 31, 1939. *b* Includes government emergency rubber. *c* Including producing countries.

THE rubber industry continued its record-breaking pace during June when 84,912 long tons were consumed, 19% above May and 77.5% over June, 1940, according to statistics reported by the R.M.A.

Crude rubber imports in June, at 65,093 long tons, were 35.8% below the May total of 101,404 long tons, but 20.8% above the June, 1940, figure of 53,889 tons, according to preliminary statistics released by the Department of Commerce. The average declared value per pound was 18.2¢, against 17.9¢ in May, and the highest in the past 18 months.

The R. M. A. estimated June reexports at 300 long tons.

Total domestic stocks on June 30, including government reserves, totaled 339,108 long tons, 5.6% below May, but more than double the stocks estimated for June 30, 1940. The Department of Commerce reported that government stocks of crude rubber increased during June to 205,003 long tons, compared with 188,804 on May 31, this increase of 16,199 tons leaving 48,894 tons imported for trade use during June.

Stocks afloat for U. S. ports on June 30 were the highest yet reported—175,499 long tons.

United States Reclaimed Rubber Statistics—Long Tons

Year	Production†	Consumption†	Consumption % of Crude	U. S. Stocks*†	Exports
1939	186,000	170,000	28.7	25,250	12,611
1940	208,971	190,244	29.3	32,636	11,347
1941					
Jan.	20,413	19,086	28.9	33,380	557
Feb.	19,507	18,222	29.1	33,654	1,009
Mar.	22,006	19,611	28.4	35,028	1,002
Apr.	21,574	20,427	28.6	35,336	....
May	22,775	21,405	30.0	35,871	....
June	23,790	22,559	26.5	36,265	....

*Stocks on hand the last of the month or year. †Corrected to 100% from estimates of reported coverage. *Compiled by The Rubber Manufacturers Association, Inc.*

RECLAIMED RUBBER

ACCORDING to R.M.A. figures, June reclaimed rubber consumption is estimated at 22,559 long tons, 5.4% above the May figure; production, 23,790 long tons; and stocks on hand June 30, 36,265 long tons. The demand for reclaim during July was reported to be highly active, and production was holding at near-capacity levels. While crude rubber consumption has undergone restrictions, no comparable measures have been taken in regard to reclaim. Under such conditions the percentage of reclaim used based on crude rubber consumed should show an increase in future months. The market continues steady; compound tubes, quoted at 9¾ - 11¾¢ per pound last month, are now 9¾ - 11¾¢.

New York Quotations

July 22, 1941

	Sp. Grav.	¢ per lb.
Auto Tire		
Black Select	1.16-1.18	6½/ 6¾
Acid	1.18-1.22	7½/ 7¾
Shoe		
Standard	1.56-1.60	7 / 7¼
Tubes		
Red Tube	1.15-1.30	10¾/11¼
Compound	1.10-1.20	9¾/11¾
Miscellaneous		
Mechanical Blends	1.25-1.50	4½/ 5½
White	1.35-1.50	13½-14½

The above list includes those items or classes only that determine the price bases of all derivative reclaim grades. Every manufacturer produces a variety of special reclaims in each general group separately featuring characteristic properties of quality, workability, and gravity at special prices.

Financial

(*Continued from page 68*)

St. Joseph Lead Co., New York, N. Y., and subsidiaries. First half, 1941: net income, $2,518,957, against $2,576,820 in the first half of 1940.

Tyer Rubber Co., Andover, Mass. Year ended February 28: net income $95,111, against $103,696 in the previous fiscal year.

United Shoe Machinery Corp., Boston, Mass. Year ended February 28, 1941: net income after taxes, $8,204,130.41, equal, after preferred dividend requirements, to $3.40 a common share.

Dividends Declared on page 94

New York Outside Market (Continued)

	July, 1941					
	21	22	23	24	25	26†
No. 1-X R.S.S. in cases	22¾	22½	22¾	22¾	23¼	..
No. 1 Thin Latex Crepe	23½	23⅝	23⅞	23⅞	24⅜	..
No. 2 Thick Latex Crepe	23½	23⅝	23⅞	23⅞	24⅜	..
No. 1 Brown Crepe	21	21⅛	21⅜	21⅜	21⅞	..
No. 2 Brown Crepe	20¾	20⅞	21⅛	21⅛	21⅝	..
No. 2 Amber	21	21⅛	21⅜	21⅜	21⅞	..
No. 3 Amber	20¾	20⅞	21⅛	21⅛	21⅝	..
Rolled Brown	19½	19⅝	19⅞	19⅞	20⅜	..

† Closed.

Tractor Sales Up

Automotive Industries in a recent survey reported that last year 282,707 tractors of all types were sold, in comparison with 216,024 in 1939. The total for the wheel type of all kinds was 249,893, against 185,321. Of the wheel type, the respective figures for those with steel tires were 21,079 and 35,471; and for those with rubber tires, 228,814 and 149,850. For the "all purpose" group sales totaled 223,447 last year and 155,285 the year before. Equipped with steel tires were 10,319, against 22,633; and with rubber tires, 213,128, against 132,652. The 1940 total for "except all purpose" was 26,446, and the 1939 figure, 30,036. Of these, those sold with steel tires were 10,760, against 12,838; and with rubber tires, 15,686, against 17,198. Sales of the tracklaying type of tractor of all sizes reached 25,086, against 21,104 in 1939.

A.S.T.M. Meeting

(*Continued from page* 54)

provided that the paper or cloth is of the same construction, that methods of manufacture are the same, etc.

A. F. Schildhauer, Fabrikoid Division, E. I. du Pont de Nemours & Co., Inc., Wilmington, Del., has been appointed chairman of the newly authorized subcommittee to develop standard methods of test for proofed fabrics. Subcommittee VI on Packings plans the development of test methods applicable to automotive gaskets.

Committees on Plastics and Textiles

The report of Committee D-20 on Plastics included three new standards which were accepted by the Society and which covered: test for deformation of plastics under load at elevated temperatures; preconditioning plastics and electrical insulating materials; and test for color fastness of plastics to light.

The report of Committee D-13 on Textile Materials recommended the revision of the existing standard for the testing of tolerances for tire cord, woven and on cones (D179-38).

M. Castricum and A. N. Benson, both of United States Rubber Co., Detroit, Mich., in a technical paper discussed the effect of rate of loading on tensile strength of cord and yarn. Using an inclined plane cord tester having a variable speed drive, it was found that there is a linear relation between strength and the logarithm of the rate of loading. Some of the results were obtained with the use of 4/2 tire cord.

18th Chemical Industries Exposition Set for December 1-6

THE Eighteenth Exposition of Chemical Industries, to be held at Grand Central Palace, New York, N. Y., December 1 to 6, 1941, will include many exhibits which show the response of American chemical industries to production problems created by national defense. Three entire floors of the Palace are reserved, and at this time, five months before the exposition, practically all available exhibit area is reserved.

As in the case of all past expositions, this one will be under the personal direction of Charles F. Roth. Chairman of the advisory committee is M. C. Whitaker, vice president of the American Cyanamid & Chemical Corp.

The Society of Chemical Industry has awarded to E. K. Bolton the Chemical Industry Medal for 1941, given each year to a person making a valuable application of chemical research to industry. The recipient has been chemical director of E. I. du Pont de Nemours & Co., Inc., Wilmington, Del., since 1930 and has been actively associated with the research leading to the development of neoprene and nylon.

Rims Approved and Branded by The Tire & Rim Association, Inc.

Rim Size	1940	3 Months, 1941
PASSENGER CAR RIMS		
15" and 16" Drop Center (See Table of Not Branded Rims at End)		
16x3.50D	229,129	12,688
16x4.00E	7,058,735	1,877,592
16x4.25E	559,796	5,655
15x4.50E	131,597	2,399
16x4.50E	3,396,007	968,106
15x5.00E	173,772	62,943
16x5.00E	514,203	331,606
15x5.00F	204,471	32,388
16x5.00F	1,594,209	479,790
15x5.50F	471,759	266,763
16x5.50F	35,890	7,415
16x6.00F	16,665	18,269
16x4.00E "Hump"	.....	578,736
16x4.25E "Hump"	.....	172,832
16x4.50E "Hump"	.....	2,582
15x5.00F "Hump"	.....	10,691
15x5.50F "Hump"	.....	4,914
15x6-L	.....	98,705
15" and 16" Drop Center—Low Flange		
All Sizes	1,166	.....
17" and Over Drop Center		
All Sizes	116,067	17,017
Flat Base for Balloon Tires		
All Sizes	5,345	.....
Clincher		
All Sizes	2,908	1,551
TRUCK AND BUS RIMS		
Flat Base		
15x5	.....	8,395
17x5	45,607	13,103
18x5	9,388	299
20x5	521,842	138,854
17x6	114,501	30,826
18x6	3,437	311
20x6	1,345,834	426,444
24x6	12,491	3,315
15x7	8,280	3,288
17x7	382	.....
18x7	13,292	2,449
20x7	1,005,639	533,507
22x7	143	.....
24x7	5,751	429
15x8	3,633	2,053
18x8	98,386	8,841
20x8	301,066	144,465
22x8	22,090	9,361
24x8	6,383	871
15x9/10	46	.....
18x9/10	3,455	4,185
20x9/10	40,880	19,406
22x9/10	13,450	4,407
24x9/10	19,590	3,944
19x11	5,515	1,933
20x11	4,648	2,849
24x11	3,724	1,361
Semi-Drop Center for Light Trucks		
16x4.50E	46,588	21,740
15x5.50F	1,198	1,824
16x5.50F	200,077	98,878

Rim Size	1940	3 Months, 1941
AGRICULTURAL RIMS		
Drop Center and Semi-Drop Center		
12x2.50C	8,222	2,014
15x2.50C	160	3,614
18x2.50C	5,188	.....
12x3.00D	24,136	2,744
15x3.00D	201,164	66,182
16x3.00D	42,815	18,857
18x3.00D	2,163	254
19x3.00D	66,273	31,866
21x3.00D	9,905	3,753
24x3.00D	814	.....
30x3.00D	977	.....
36x3.00D	2,098	190
40x3.00D	590	.....
17x3.25E	.....	336
18x3.25E	2,204	1,872
21x3.25E	6,287	3,496
18x4.00E	5,762	.....
28x4.00E	.....	255
18x4.19F	773	.....
20x4.50E	10,586	2,661
22x4.50E	8,771	1,239
24x4.50E	.....	114
36x4.50E	3,097	1,502
13x5.50F	13,412	335
18x5.50F	19,880	7,458
20x5.50F	12,333	4,596
20x5.50R	1,343	.....
24x5.50R	6,154	4,627
32x5.50R	96	396
36x5.50R	830	284
40x5.50R	2,126	801
24x6.00S	8,961	2,632
28x6.00S	1,320	129
36x6.00S	20,001	3,365
40x6.00S	6,593	769
20x8.00T	2,858	564
24x8.00T	47,561	15,334
28x8.00T	26,831	4,671
32x8.00T	9,799	2,366
36x8.00T	31,164	4,067
40x8.00T	1,757	.....
42x8.00T	173	.....
W4-30	.....	106
W4-40	462	.....
W4-44	151	.....
W4.5-40	1,075	976
W4.5-44	120	.....
W5-40	321	.....
W5-44	399	.....
W6-28	637	.....
W6-32	12,801	580
W6-36	500	.....
W6-44	1,957	.....
W7-24	33,022	8,489
W7-32	27,013	11,207
W7-36	3,200	11,536
W7-38	5,789	1,354
W7-44	.....	1,045
W8-24	73,994	16,541
W8-28	2,313	1,286
W8-32	7,386	5,640
W8-36	4,628	4,515
W8-38	19,692	9,371
W8-40	3,627	2,629

Rim Size	1940	3 Months, 1941
AGRICULTURAL RIMS—(*Continued*)		
W9-24	547	979
W9-28	6,921	.....
W9-36	4,220	7,765
W9-38	13,565	3,278
W9-40	187	361
W10-24	358	451
W10-26	456	.....
W10-28	21,661	7,574
W10-36	12,672	22,606
W10-38	1,756	345
W10-40	4,158	4,962
W11-24	993	2,491
W11-26	421	.....
W11-28	408	1,293
W11-32	465	190
W11-36	.....	259
DW7-38	1,809	.....
DW8-38	18,374	15,893
DW9-26	674	.....
DW9-36	1,574	.....
DW9-38	53,063	25,555
DW10-26	2,136	.....
DW10-28	2,331	.....
DW10-36	1,049	.....
DW10-38	23,704	11,596
DW11-24	473	1,214
DW11-26	350	.....
DW11-28	3,529	3,622
DW11-30	374	207
DW11-32	908	2,961
DW11-36	2,303	3,417
DW11-38	5,263	1,822
DW12-30	3,353	845
CAST RIMS		
10x5.00F	968	42
10x6.00F	608	281
24x10.00	16	.....
20x11.25	2	12
24x11.25	15	.....
32x11.25	.....	8
24x13.00	173	259
24x15.00	827	230
40x15.00	112	7
32x17.00	10	.....
32x18.00	36	80
AIRPLANE RIMS		
All sizes	2,437	.....
Totals	19,378,558	6,829,293

"Hump Bead Seat" Rims Inspected but Not Branded (Not Listed Above)

Passenger Car Rims—15" and 16" Drop Center		
16x4.00E	1,972,182	523,562
16x4.25E	444,206	145,323
16x4.50E	8,620	2,550
15x5.00F	.....	10,687
15x5.50F	90,085	.....
Total	2,515,093	682,122

COMPOUNDING INGREDIENTS

ALTHOUGH rubber consumption last month was curtailed by government action, the demand for compounding ingredients in general continued at a high level. Future developments in the market are somewhat uncertain, but it is likely that the demand for certain types of compounding ingredients which are used in relatively larger quantities for defense rubber goods will be less affected by the government order than materials used in the same proportion for both defense and civilian goods.

CARBON BLACK. Demand continued active although it fell off somewhat during the latter part of July. Production is reported to be sufficient to meet all demands. Producers' supplies of carbon black declined 21,000,000 pounds during June to reach 124,000,000 pounds on June 30. Prices advanced on July 1, as announced here last month.

FACTICE OR RUBBER SUBSTITUTE. Demand has increased appreciably. Prices on certain grades have been revised somewhat.

LITHARGE. Buying interest continued for the month at a high level. Prices are steady.

LITHOPONE. Demand during July was heavy, with regular customers receiving preference in filling orders. The market tightened toward the end of the month. Prices are firm.

RUBBER CHEMICALS. The demand continued at a high level last month, exceeding business for the same period of 1940, and at about the same level as the preceding month. Prices in general are steady.

RUBBER SOLVENTS. Rubber tire manufacturers ordered large amounts, and other consumers were actively buying last month. Prices remained firm.

TITANIUM PIGMENTS. The demand has exceeded production rates, and producers have started to allocate pigment orders, giving preference to regular customers. Prices are firm and unrevised.

ZINC OXIDES. Pacific Coast prices advanced ½¢ per pound during the week ending July 5. The demand from both the paint and the rubber industry continued abnormally heavy. As pointed out last month, zinc oxide was included in General Preference Order M-11, effective July 1, which provides that all producers set aside a certain portion of their production in the interest of national defense. There is reported to be ample zinc oxide for all defense uses, but not sufficient for both defense demand and the present abnormally heavy demand for civilian uses.

Current Quotations*

Abrasives

Pumicestone, powdered	lb.	$0.0325/$0.035
Rottenstone, domestic	lb.	.025 / .03

Accelerators, Inorganic

Lime, hydrated, *l.c.l.*, New York	ton	20.00
Litharge (commercial)	lb.	.0825/ .09

*Prices in general are f.o.b. works. Range indicates grade or quantity variations. Space limitation prevents listing of known ingredients. Requests for information not recorded will receive prompt attention.

Accelerators, Organic

A-1	lb.	$0.24 /$0.30
A-10	lb.	.31 / .35
A-19	lb.	.52 / .65
A-32	lb.	.70 / .80
A-77	lb.	.42 / .55
A-100	lb.	.42 / .55
Accelerator 49	lb.	.41 / .42
531	lb.	.48 / .50
737	lb.	.42 / .43
737-50	lb.	.25 / .26
808	lb.	.70 / .72
833	lb.	1.15
Acrin	lb.	.60
Aldehyde ammonia	lb.	.65 / .70
Altax	lb.	.55 / .60
B-J-F	lb.	.50 / .55
Beutene	lb.	.70 / .75
Butyl Eight	lb.	.98 / 1.00
Zimate	lb.	1.75
C-P-B	lb.	2.00
Captax	lb.	.50
Crylene	lb.	
Paste	lb.	
D-B-A	lb.	2.00
Delac A	lb.	.40 / .50
O	lb.	.40 / .50
P	lb.	.40 / .50
Di-Esterex-N	lb.	.60 / .70
DOTG (Di-ortho-tolyguanidine)	lb.	.44 / .46
DPG (Diphenylguanidine)	lb.	.35 / .45
El-Sixty	lb.	.50 / .65
Ethylidene analine	lb.	.42 / .43
Ethyl Zimate	lb.	1.75
Formaldehyde P.A.C	lb.	.06
Formaldehyde-para-toluidine	lb.	.57 / .59
Formaniline	lb.	.31 / .32
Guantal	lb.	.40 / .50
Hepteen	lb.	.35 / .40
Base	lb.	1.35 / 1.50
Hexamethylenetetramine U.S.P.	lb.	.39
Technical	lb.	.33
Lead oleate, No. 999	lb.	.14
Witco	lb.	.15
Ledate	lb.	1.50
Monex	lb.	1.75
Novex	lb.	
O-X-A-F	lb.	.50 / .55
Oxynone	lb.	.77 / .90
Para-nitroso-dimethylaniline	lb.	.85
Pentex	lb.	1.00 / 1.10
Flour	lb.	.15 / .16
O	lb.	
Flour	lb.	
Phenex	lb.	.50 / .55
Pip-Pip	lb.	1.90
Pipsolene	lb.	1.55 / 1.80
R-23	lb.	.40
R & H 50-D	lb.	.42 / .43
Rotax	lb.	.60 / .65
Safex	lb.	1.20 / 1.30
Santocure	lb.	.80 / 1.00
Selenac	lb.	2.25
SPDX	lb.	.70 / .75
A	lb.	.70 / .75
Super sulphur No. 2	lb.	.14 / .16
Tetrone A	lb.	2.20
Thiocarbanilide	lb.	.24 / .30
Thionex	lb.	1.75
Thiurad	lb.	1.75
Trimene	lb.	.55 / 65
Base	lb.	1.05 / 1.20
Triphenylguanidine (TPG)	lb.	.45
Tuads	lb.	1.75
2-MT	lb.	.54
Ulto	lb.	1.25 / 1.50
Ureka	lb.	.60 / .75
Blend B	lb.	.60 / .75
C	lb.	.56 / .65
Vulcanex	lb.	.42 / .43
Vulcanol	lb.	.85
Z-B-X	lb.	2.50
Zenite	lb.	.46 / .48
A	lb.	.53 / .55
B	lb.	.46 / .48
Zimate (Methyl)	lb.	1.60

Activators

Aero Ac 50	lb.	.46 / .52
Barak	lb.	.50
MODX	lb.	.30 / .35
SL No. 20	lb.	.085 / .10

Age Resisters

AgeRite Alba	lb.	2.00
Gel	lb.	.57 / .59
Hipar	lb.	.65 / .67
Powder	lb.	.52 / .54
Resin	lb.	.52 / .54
D	lb.	.52 / .54
White	lb.	1.25 / 1.40
Akroflex C	lb.	.56 / .58
Albasan	lb.	.70 / .75
Aminox	lb.	.52 / .61
Antox	lb.	.56
Betanox	lb.	.52 / .61
Special	lb.	.65 / .74
B-L-E	lb.	.52 / .61
Powder	lb.	.65 / .74
B-X-A	lb.	.52 / .61
Copper Inhibitor X-872-A	lb.	1.15
Flectol B	lb.	$0.52 /$0.65
H	lb.	.52 / .65
White	lb.	.90 / 1.15
M-U-F	lb.	1.50
Neozone (standard)	lb.	.63
A	lb.	.52 / .54
B	lb.	.63
C	lb.	.52 / .54
D	lb.	.52 / .54
E	lb.	.63
Oxynone	lb.	.77 / .90
Parazone	lb.	.68
Permalux	lb.	1.20
Santoflex B	lb.	.52 / .65
BX	lb.	.58 / .71
Santovar A	lb.	1.15 / 1.40
Solux	lb.	1.30
Stabilite	lb.	.52 / .54
Alba	lb.	.70 / .75
Thermoflex	lb.	1.20 / 1.15
A	lb.	.65 / .67
Tysonite	lb.	.16 / .165
V-G-B	lb.	.52 / .61

Alkalies

Caustic soda, flake, Columbia (400-lb. *drums*)	100 lbs.	2.70 / 3.55
liquid, 50%	100 lbs.	1.95
solid (700-lb. *drums*)	100 lbs.	2.30 / 3.15

Antiscorch Materials

A-F-B	lb.	.35 / .40
Antiscorch T	lb.	.90
Cumar RH	lb.	.10
E-S-E-N	lb.	.35 / .40
R-17 Resin (*drums*)	lb.	.10
RM	lb.	1.25
Retarder W	lb.	.36
Retardex	lb.	.45 / .48
U-T-B	lb.	.35 / .40

Antiseptics

Compound G-4	lb.	
G-11	lb.	

Antisun Materials

Heliozone	lb.	.23 / .24
S.C.R.	lb.	.33 / .35
Sunproof	lb.	.23 / .28
Jr.	lb.	.165 / .215

Blowing Agents

Ammonium Carbonate, lumps (500-lb. *drums*)	lb.	.0825
Unicel	lb.	.50

Brake Lining Saturant

B.R.T. No. 3	lb.	.0165/ .0175

Colors

Black

Du Pont powder	lb.	.42 / .44
Lampblack (commercial), *l.c.l.*	lb.	.15

Blue

Du Pont Dispersed	lb.	.83 / 3.95
Powders	lb.	2.25 / 3.75
Heliogen BKA	lb.	
Toners	lb.	

Brown

Mapico	lb.	.11

Green

Chrome	lb.	.23
oxide (*freight allowed*)	lb.	.24
Du Pont Dispersed	lb.	.98 / 2.85
Powders	lb.	1.00 / 5.50
Guignet's (*bbls.*)	lb.	.70
Toners	lb.	

Orange

Du Pont Dispersed	lb.	.88 / 2.00
Powders	lb.	.88 / 2.75
Toners	lb.	

Orchid

Toners	lb.	

Pink

Toners	lb.	

Purple

Toners	lb.	

Red

Antimony		
Crimson, 15/17%	lb.	.30
R. M. P. No. 3	lb.	.48
Sulphur free	lb.	.52
R.M.P.	lb.	.52
Golden 15/17%	lb.	.28
7-A	lb.	.37
Z-2	lb.	.23
Cadmium, light (400-lb. *bbls.*)	lb.	.85 / .85
Du Pont Dispersed	lb.	.93 / 2.05
Powders	lb.	.285 / 1.65
Iron Oxide, *l.c.l.*	lb.	.06 / .11
Mapico	lb.	.0975
Rub-Er-Red (*bbls.*)	lb.	.0975
Toners	lb.	

White

Lithopone (*bags*)	lb.	.0385/ .0410
Albalith	lb.	.0385/ .0410
Astrolith (50-lb. *bags*)	lb.	.0385/ .0410
Azolith	lb.	.0385/ .0410

Titanium Pigments
- Ray-bar ..... lb. $0.055 /$0.065
- Ray-cal ..... lb. .0525/ .0625
- Rayox ..... lb. .135 / .165
- Titanolith (50-lb. bags) ... lb. .0525/ .055
- Titanox-A ..... lb. .145 / .175
- B ..... lb. .0575/ .0625
- 30 ..... lb. .0575/ .0625
- C ..... lb. .055 / .06
- M ..... lb. .0575/ .0625
- Ti-Tone ..... lb.
- Zopaque (50-lb. bags) lb. .145 / .15

Zinc Oxide
- Azo ZZZ-11 ..... lb. .065 / .0675
- 44 ..... lb. .065 / .0675
- 55 ..... lb. .065 / .0675
- 66 ..... lb. .08 / .0825
- French Process, Florence
- Green Seal-8 ..... lb. .0825/ .0850
- Red Seal-9 ..... lb. .0775/ .08
- White Seal-7 ..... lb. .0875/ .09
- Kadox, Black Label-15 .... lb. .065 / .0675
- No. 25 ..... lb. .0775/ .08
- Red Label-17 ..... lb. .065 / .0675
- Horse Head Special 3 .... lb. .065 / .0675
- XX Red-4 ..... lb. .065 / .0675
- 23 ..... lb. .065 / .0675
- 72 ..... lb. .065 / .0675
- 78 ..... lb. .065 / .0675
- 80 ..... lb. .065 / .0675
- 103 ..... lb. .065 / .0675
- 110 ..... lb .065 / .0675
- St. Joe (lead free)
- Black Label ..... lb. .065 / .0675
- Green Label ..... lb. .065 / .0675
- Red Label ..... lb. .065 / .0675
- U.S.P ..... lb. .0975/ .10

Zinc Sulphide Pigments
- Cryptone-BA-19 ..... lb. .0525/ .055
- BT ..... lb. .0525/ .055
- CB ..... lb. .0525/ .055
- MS ..... lb. .055 / .0575
- ZS No. 20 ..... lb. .0775/ .08
- 86 ..... lb. .0775/ .08
- 230 ..... lb. .0775/ .08
- 800 ..... lb. .0775/ .08
- Sunolith ..... lb. .0385/ .0410

Yellow
- Cadmolith (cadmium yellow), (400-lb. bbls.) ..... lb. .55 / .60
- Du Pont Dispersed ..... lb. 1.25 / 1.75
- Powders ..... lb. .145 / 1.37
- Mapico ..... lb. .0725
- Toners ..... lb.

Dispersing Agents
- Bardex ..... lb. .0395/ .042
- Bardol ..... lb. .0225/ .025
- Darvan No. 1 ..... lb. .30 / .34
- No. 2 ..... lb. .30 / .34
- Nevoll (drums, c.l.) ..... lb. .0225
- Santomerse S ..... lb. .11 / .25

Fillers, Inert
- Asbestine, c.l. ..... ton 15.00
- Barytes ..... ton 30.00 /36.00
- f.o.b., St. Louis (50-lb. paper bags) ..... ton 22.85
- off color, domestic ..... ton 21.50 /26.50
- white, imported ..... ton
- Blanc fixe, dry, precip ..... lb. .0325/ .035
- Calcene ..... ton 37.50 /43.00
- Infusorial earth ..... lb. .025 / .03
- Kalite No. 1 ..... ton 24.00 /30.00
- 3 ..... ton 34.00 /40.00
- Kalvan ..... ton 95.00
- Magnesia, calcined, heavy ... lb.
- Magnesium Carbonate, l.c.l. .lb. .0725/ .095
- Paradene No. 2 (drums) .... lb. .045
- Pyrax A ..... ton 7.00
- Whiting
- Columbia Filler ..... ton 9.00 /14.00
- Suprex, white extra light . ton 30.00
- heavy ..... ton 30.00
- Witco, c.l. ..... ton 7.00

Finishes
- Black-Out (surface protective) ..... gal. 4.00 / 5.00
- Mica, l.c.l. ..... ton 42.00 /52.00
- Rubber lacquer, clear ..... gal. 1.00 / 2.00
- colored ..... gal. 2.00 / 3.50
- Shoe Varnish ..... gal. 1.45
- Talc ..... ton .025 / .035

Flock
- Cotton flock, dark ..... lb. .085 / .12
- dyed ..... lb. .40 / .80
- white ..... lb. .12 / .18
- Rayon flock, colored ..... lb. 1.00 / 2.00
- white ..... lb. .75 / 1.00

Latex Compounding Ingredients
- A-342 ..... lb. 1.00 / 1.25
- Accelerator 85 ..... lb. .35
- 89 ..... lb. 1.20
- 122 ..... lb. 1.30
- 552 ..... lb. 1.90
- Aerosol OT Aqueous 10% .. lb. 1.25
- Antox, dispersed ..... lb. .42
- Aquarex D ..... lb. .75
- F ..... lb. .85
- Areskap No. 50 ..... lb. .18 / .24
- 100, dry ..... lb. .39 / .51
- Aresket No. 240 ..... lb. .16 / .22
- 300, dry ..... lb. .42 / .50
- Aresklene No. 375 ..... lb. $0.35/ $0.50
- 400, dry ..... lb. .51 / .65
- Black No. 25, dispersed ..... lb. .22 / .40
- Casein ..... lb. .21
- Collocarb ..... lb. .06
- Color Pastes, dispersed ..... lb. .38 / 1.90
- Copper Inhibitor X-872 ..... lb. 2.25
- Dispersex No. 15 ..... lb. .11 / .12
- No. 20 ..... lb. .08 / .10
- Factex Dispersion A ..... lb. .16
- Heliozone, dispersed ..... lb. .25
- Igepon A ..... lb.
- Latac ..... lb. 2.50
- MICRONEX, Colloidal .... lb. .06 / 07
- Nekal BX (dry) ..... lb.
- Pipsol X ..... lb. 3.05 / 3.55
- R-2 Crystals ..... lb. 2.50 / 2.75
- RN-2 Crystals ..... lb. 1.90 / 2.15
- S-1 (400-lb. drums) ..... lb. .65
- Santobrite Briquettes ..... lb.
- Powder ..... lb.
- Santomerse D ..... lb. .41 / .65
- S ..... lb. .11 / .25
- Stablex A ..... lb. .90 / 1.10
- B ..... lb. .65 / .90
- C ..... lb. .40 / .50
- Sulphur, dispersed ..... lb. .10 / .15
- No. 2 ..... lb. .075 / .12
- T-1 (440-lb. drums) ..... lb. .40
- Tepidone ..... lb. .90
- Vulcan Colors ..... lb.
- Zenite Special ..... lb. .55
- Zinc oxide, dispersed ..... lb. .12 / .15

Mineral Rubber
- Black Diamond, l.c. ..... ton 25.00
- B.R.C. No. 20 ..... lb. .009 / .01
- Hydrocarbon, hard ..... ton 25.00 /27.00
- Genasco Hydrocarbon, granulated ..... ton
- solid ..... ton
- Gilsonite ..... ton
- Parmr ..... ton 25.00 /29.00
- Pioneer, c.l. ..... lb. 25.00
- 285°-300° ..... ton 25.00 /27.00

Mold Lubricants
- Aluminum Stearate ..... lb. .21 / .22
- Aquarex D ..... lb. .75
- WA Paste ..... lb. .25
- Lubrex ..... lb. .25 / .30
- Mold Paste ..... lb. .12 / .18
- Rubber-Glo, conc. regular .. gal. .94 / 1.15
- Type W ..... gal. .99 / 1.20
- Sericite ..... ton 65.00 /75.00
- Soapstone, l.c.l. ..... ton 25.00 /35.00

Oil Resistant
- A-X-F ..... lb. .82 / .85

Reclaiming Oils
- B.R.V ..... lb. .032 / .0345
- No. 1621 ..... lb. .019 / .02
- S.R.O. ..... lb. .019 / .02
- X-159 ..... gal. .20 / .32
- Rox No. 1 ..... lb. .0225/ .025

Reenforcers
Carbon Black
- Aerfloted Arrow Specification (bags only) ..... lb. .0335†
- Arrow Compact Granulized ..... lb. .0335†
- Certified Heavy Compressed (bags only) .. lb. .0335†
- Spheron ..... lb. .0335†
- Continental, dustless ..... lb. .0335†
- Compressed (bags only) . lb. .0335†
- Disperso ..... lb. .0335†
- Dixie ..... lb. .0335†
- Dixiedensed ..... lb. .0335†
- 66 ..... lb. .0335†
- Excello, dustless ..... lb. .0335†
- Furnex ..... lb. .03
- Beads ..... lb.
- Gastex ..... lb. .03 / .07
- Kosmobile ..... lb. .0335†
- 66 ..... lb. .0335†
- Kosmos ..... lb. .0335†
- MICRONEX Beads ..... lb. .0335†
- Mark II ..... lb. .0335
- Standard ..... lb. .0335
- W-5 ..... lb. .0335
- W-6 ..... lb. .0335
- P-33 ..... lb. .0475
- Pelletex ..... lb. .03 / .07
- Supreme, dustless ..... lb. .0335†
- Thermax ..... lb. .0225
- Velvetex ..... lb. .04 / .06
- "WYEX BLACK" ..... lb. .0335†
- Carbonex Flakes ..... lb. .029 / .034
- S ..... lb. .03 / .0350

Clays
- Aerfloted Paragon (50-lb. bags) ..... ton 10.00
- Suprex (50-lb. bags) .. ton 10.00
- Barden ..... ton 10.00
- Catalpo, c.l. ..... ton 30.00
- Clay "L" ..... ton 8.00
- Chicora ..... ton 10.00
- China ..... ton 22.50
- Crown ..... ton 10.00
- Dixie ..... ton $10.00
- Hi-White ..... ton 10.00
- Langford ..... ton 7.50
- McNamee ..... ton 10.00
- Par ..... ton 10.00
- Paraforce, c.l. ..... ton 60.00
- Witco, c.l. ..... ton 10.00
- Cumar EX ..... lb. .045
- MH ..... lb. .06 /$0.11
- V ..... lb. .09 / .12
- Silene ..... lb. .04 / .045

Reodorants
- Amora A ..... lb.
- B ..... lb.
- C ..... lb.
- D ..... lb.
- Curodex 19 ..... lb.
- 188 ..... lb.
- 198 ..... lb.
- Para-Dors ..... lb.
- Rodo No. 0 ..... lb. 3.50 / 4.00
- 10 ..... lb. 4.50 / 5.00

Rubber Substitutes
- Black ..... lb. .08 / .13
- Brown ..... lb. .08 / .135
- White ..... lb. .085 / .145
- Factice
- Amberex Type B ..... lb. .1875
- Brown ..... lb. .09 / .115
- Fac-Cel B ..... lb. .135
- C ..... lb. .135
- Neophax A ..... lb. .1225
- B ..... lb. .1225
- White ..... lb. .09 / .135

Softeners and Plasticizers
- B.R.T. No. 7 ..... lb. .0165/ .0175
- Bondogen ..... lb. .98 / 1.05
- Burgundy pitch ..... lb.
- Copene Resin ..... lb. .205
- Cycline oil ..... gal. .14 / .20
- Dipolymer Oil ..... gal. .30 / .35
- Dispersing Oil No. 10 ..... lb. .0335/ .036
- Nevinol ..... lb. .13 / .14
- Nuba resinous pitch (drums)
- Grades No. 1 and No. 2 .. lb. .0265
- 3-X ..... lb. .04
- Nypene Resin ..... lb. .205
- Palm oil (Witco), c.l. ..... lb.
- Palmol ..... lb. .13
- Para Flux ..... gal .09 / .18
- No. 2016 ..... gal. .125 / .20
- Para Lube ..... lb. .0425/ .048
- Piccolyte Resin ..... lb. .14 / .165
- Pine tar ..... gal.
- Oil ..... gal. .30
- Plastogen ..... lb. .0775/ .08
- Plastone ..... lb. .27 / .30
- R-19 (Resin (drums) ..... lb. .10
- 21 Resin (drums) ..... lb. .10
- Reogen ..... lb. .12 / .18
- RPA No. 1 ..... lb. .65
- 2 ..... lb. .65
- 3 ..... lb. .46
- 4 ..... lb. .80
- Tackol ..... lb. .085 / .18
- Tonox ..... lb. .52 / .61
- Tonox D ..... lb. .75 / .85
- Witco No. 20, l.c.l. ..... gal. .20
- X-1 resinous oil (tank car) .. lb. .011

Softeners for Hard Rubber Compounding
- Resin C Pitch 45° C. M.P. .. lb. .013 / .014
- 60°C. M.P. ..... lb. .013 / .014
- 75°C. M.P. ..... lb. .013 / .014

Solvents
- Beta-Trichlorethane ..... lb. .20
- Carbon Bisulphide ..... lb. .05
- Tetrachloride ..... gal. .665
- Cosol No. 1 ..... gal. .25 / .30
- No. 2 ..... gal. .22 / .30
- No. 3 ..... gal. .22 / .30
- Industrial 90% benzol (tank car) ..... gal. .14 / .21
- Medium Ketone ..... gal. .35
- Skellysolve ..... gal.

Stabilizer for Cure
- Calcium Stearate ..... lb. .23 / .25
- Laurex (bags) ..... lb. .1175/ .1425
- Lead Stearate ..... lb. .25
- Stearex B ..... lb. .1325/ .1425
- Beads ..... lb. .1275/ .1375
- Stearic acid, single pressed .. lb. .1325/ .1425
- Stearite, c.l. ..... lb. .1275
- Zinc stearate ..... lb. .27 / .28

Synthetic Rubber
- Neoprene Type E ..... lb. .65
- G ..... lb. .70
- GN ..... lb. .65
- I ..... lb. .70
- KN ..... lb. .75
- M ..... lb. .65
- Latex Type 56 ..... lb. .30
- 57 ..... lb. .30
- Synthetic 100 ..... lb. .41

Tackifier
- B.R.H. No. 2 ..... lb. .017 / .02

†Price quoted is f.o.b. works (bags). The price f.o.b. works (bulk) is $0.0315 per pound. All prices are carlot.

(Continued on page 88)

COTTON AND FABRICS

NEW YORK COTTON EXCHANGE WEEK-END CLOSING PRICES

Futures	May 31	June 28	July 5	July 12	July 19	July 26
July	13.08	14.50	14.62	15.37	.....	.....
Aug.	.....	14.55	14.68	15.35	16.12	17.06
Sept.	13.18	14.60	14.74	15.43	16.22	17.16
Dec.	13.33	14.77	14.89	15.68	16.44	17.39
Mar.	13.29	14.78	14.95	15.72	16.53	17.51
May	13.24	14.80	14.95	15.73	16.55	17.51

New York Quotations

July 28, 1941

Drills		
38-inch 2.00-yard	yd.	$0.18
40-inch 3.47-yard		.11
50-inch 1.52-yard		.24⅜
52-inch 1.85-yard		.20⅛
52-inch 1.90-yard	.19¾	/.21⅞
52-inch 2.20-yard		.20½
52-inch 2.50-yard		.18
59-inch 1.85-yard		.22½
Ducks		
38-inch 2.00-yard D. F.	yd. .18	/.20
40-inch 1.45-yard S. F.		.24½
51½-inch 1.35-yard D. F.		.28⅞
72-inch 1.05-yard D. F.		.40
72-inch 17-21 ounce		.43⅝
Mechanicals		
Hose and belting	lb.	.37
Tennis		
51¾-inch 1.35-yard	yd.	.27
51¾-inch 1.60-yard	yd.	.23½
51¾-inch 1.90-yard	yd.	.19¾
Hollands—White		
Blue Seal		
20-inch	yd.	.12
30-inch		.21½
40-inch		.24
Gold Seal		
20-inch No. 72	yd.	.12¾
30-inch No. 72		.22½
40-inch No. 72		.25½
Red Seal		
20-inch	yd.	.11¼
30-inch		.20¼
40-inch		.22½
Osnaburgs		
40-inch 2.34-yard	yd.	.15
40-inch 2.48-yard		.14⅛
40-inch 2.56-yard		.14¼
40-inch 3.00-yard		.11⅞
40-inch 7-ounce part waste	.12⅝	/.12¾
40-inch 10-ounce part waste		.18⅛
37-inch 2.42-yard		.14½
Raincoat Fabrics		
Cotton		
Bombazine 64 x 60	yd.	
Plaids 60 x 48		
Surface prints 64 x 60		
Print cloth, 38½-inch, 64 x 60		.08037
Sheetings, 40-Inch		
48 x 48, 2.50-yard	yd.	.1420
64 x 68, 3.15-yard		.12063
36 x 60, 3.60-yard		.10555
44 x 40, 4.25-yard		.08588
Sheetings, 36-Inch		
48 x 48, 5.00-yard	yd.	
44 x 40, 6.15-yard		.06179
Tire Fabrics		
Builder		
17¼ ounce 60" 23/11 ply Karded peeler	lb.	.36
Chafer		
14 ounce 60" 20/8 ply Karded peeler	lb.	.35½
9¾ ounce 60" 10/2 ply Karded peeler	lb.	.35
Cord Fabrics		
23/5/3 Karded peeler, 1 1/16" cotton	lb.	.36½
15/3/3 Karded peeler, 1 1/16" cotton	lb.	.34½
12/4/2 Karded peeler, 1 1/16" cotton	lb.	.33½
23/5/3 Karded peeler, 1¼" cotton	lb.	.42
23/5/3 Combed Egyptian	lb.	.55½
Leno Breaker		
8¼ ounce and 10¼ ounce 60" Karded peeler	lb.	.38

FOR the first time since early 1930 cotton futures quotations crossed the 17¢ level, on July 22. The New York ⅛-inch spot middling price, after closing at 15.24¢ per pound on June 30, strengthened to reach 17.41¢ on July 22. However the price fell 40 points to 17.01¢ the following day, July 23, when it was reported that the government contemplated the sale of government-owned cotton to prevent an undue advance in the price; heavy liquidation greeted this news, forcing the price down. Last month witnessed the highest spot quotations since January, 1930, when 17.91¢ per pound was recorded July 26, but by July 30 the price had dropped to 17.08¢.

The rise in cotton was attributed in part to low acreage, which was estimated at 23,519,000 acres as of July 1, the lowest since 1895, according to the Crop Reporting Board of the United States Department of Agriculture; other factors stimulating the cotton price were unfavorable weather, late spring planting and, sometimes, forced replanting, and unusually great destruction by the boll weevil.

According to the Bureau of the Census, 73,400 bales of cotton were used for tire fabrics (cord) during May; 70,540 bales during April; and 72,838 bales during March. In percentages tire fabrics (cord) consumed 8% of the total cotton used during May; 7.7% during April; and 8.5% during March.

Consumption of cotton in domestic mills during June totaled 875,137 bales, against 918,902 bales in May, and 565,416 bales in June last year, according to the Census Bureau, for 11 months of the cotton season the total was 8,729,277 bales, against 7,161,051 bales a year ago. At the end of June mill stocks were 1,918,335 bales, and stocks in public storage were 10,570,235 bales.

Fabrics

Ending a three-week stalemate in the trading of cotton goods, the Office of Price Administration and Civilian Supply revised cotton goods price ceiling schedules upward on July 18 after a series of conferences in Washington with leading men in the cotton textile industry. The price ceilings first issued by Leon Henderson, Federal Price Administrator, on June 28, had appeared so drastic to traders in cotton goods that market activity virtually ceased. The retroactive feature of the original price ceiling, which forbade the delivery of previously contracted cotton goods at prices higher than the ceiling regardless of the contract terms, was retained in the revised schedules promulgated on July 18. Trading after July 18 was somewhat restrained while traders adjusted themselves to the new basic prices. Most cotton fabric manufacturers have their output contracted for several months ahead.

The prices quoted here are for the most part nominal figures, representative of present price conditions in the market. A clarification of schedules is expected soon after present uncertainties are dealt with.

RUBBER SCRAP

THE demand for scrap rubber continued active last month, with reclaim production continuing at high levels. Collections of scrap rubber were reported to be better last month. The market was firm, and advances were registered on the following grades of scrap: all boots and shoes; all inner tubes with the exception of No. 1 floating; black auto peelings; clean mixed solid truck tires; No. 1 and No. 2 red mechanicals. Other prices held steady.

Consumers' Buying Prices

(Carlot Lots for July 22, 1941)

		Prices
Boots and Shoes		
Boots and shoes, black	lb.	$0.01⅝/$0.01¾
Colored	lb.	.01⅜/ .0145
Untrimmed arctics	lb.	.01¾/ .01⅜
Inner Tubes		
No. 1, floating	lb.	.12 / .14
No. 2, compound	lb.	.07 / .07¼
Red	lb	.07⅜/ .07⅝
Mixed tubes	lb.	.06¾/ .06½
Tires (Akron District)		
Pneumatic Standard		
Mixed auto tires with beads	ton	16.50 /17.00
Beadless	ton	22.50
Auto tire carcass	ton	55.00 /60.00
Black auto peelings	ton	51.00 /52.50
Solid		
Clean mixed truck	ton	40.00 /44.00
Light gravity	ton	50.00 /52.00
Mechanicals		
Mixed black scrap	ton	33.00 /34.00
Hose, air brake	ton	25.00 /27.00
Garden, rubber covered	ton	12.00 /14.00
Steam and water, soft	ton	12.00 /14.00
No. 1 red	lb.	.04¾/ .05
No. 2 red	lb.	.03 / .03½
White druggists' sundries	lb.	.04 / .04¾
Mixed mechanicals	lb.	.02¾/ .03
White mechanicals	lb.	.04¼/ .04½
Hard Rubber		
No. 1 hard rubber	lb.	.15 / .16

Current Quotations

(Continued from page 86)

Vulcanizing Ingredients		
Magnesia, light (for neoprene)	lb.	$0.25
Sulphur	100 lbs.	2.00
Chloride (drums)	lb.	.04
Telloy	lb.	1.75
Vandex	lb.	1.75
(See also Colors—Antimony)		
Waxes		
Carnauba, No. 3 chalky	lb.	.63
2 N.C.	lb.	.68
3 N.C.	lb.	.635
1 Yellow	lb.	.72 /$0.73
2	lb.	.71 / .72

New Incorporations

Blue Ribbon Rubber Products Corp., Queens, N. Y. Capital 200 shares no par value. B. Ginsberg, 292 Madison Ave., New York, N. Y. Rubber products.

Consolidated Products Corp., Lynn, Mass. Capital $100,000. C. R. Whittredge, J. Haskell, R. P. Willis, and D. S. Richmond. Manufacture shoes and rubbers.

for more power to American Industry

SHAWMUT MILL
EXTRA
BELTING DUCK

Through constant cooperation with engineers of the rubber industry, our mills have developed belting fabrics scientifically designed for longer wear and greater efficiency. Shawmut Belting Duck — like other fabrics we provide for your use — is known throughout the trade for its excellent performance in the job.

WELLINGTON SEARS COMPANY
65 WORTH STREET, NEW YORK, N. Y.

World Net Imports of Crude Rubber—Long Tons

Year	U.S.A.	U.K.†	Argentine	Australia	Belgium	Canada	France	Greater Germany‡	Italy	Japan	Poland	Sweden	U.S.S.R.	Rest of World	Total
1938	406,300	168,172	7,700	12,300	11,300	25,700	58,100	107,900	28,200	46,300	7,900	8,300	26,800	49,200	928,000
1939	486,348	112,249¶	9,600	15 400	9,600	32,500	33,751§	62,344§	12,582§	42,300	5,415§	7,965*a*	14,000*	61,866	603,842¶
1940	811,564	....	10,019	19,044	1,585*b*	52,567	....	....	....	30,847*c*	....	....	....	....	....
1941															
Jan.	86,541	....	706	1,065	....	6,290	....	....	....	....	....	....	....	....	....
Feb.	73,647	....	362	1,717	....	3,770	....	....	....	....	....	....	....	....	....
Mar.	86,794	....	975	3,486	....	3,879	....	....	....	....	....	....	....	....	....
Apr.	63,000*	....	....	2,326	....	2,531	....	....	....	....	....	....	....	....	....

*Estimated. †U. K. figures show gross imports, not net imports. ‡Including imports of Austria and Czechoslovakia. ¶Up to Aug. 31, 1939, only. §Up to July 31, 1939, only. *a*Up to September 30, 1939. *b*Jan.-Feb. *c*Jan.-Aug. Source: *Statistical Bulletin of the International Rubber Regulation Committee.*

Shipments of Crude Rubber from Producing Countries—Long Tons

Year	Malaya including Brunei and Labuan	N.E.I.	Ceylon	India	Burma	North Borneo	Sarawak	Thailand	French Indo-China	Total	Philippines and Oceania	Liberia†	Nigeria (incl. Brit. Cameroons)	Other Africa	South America	Mexican Guayule	Grand Total
1939	376,800	372,000	61,000	9,200	6,600	11,900	24,000	41,800	65,200	968,500	2,100*	5,400	2,800	6,600*	16,100	2,900	1,004,400
1940	540,417	536,899	88,930	13,649	9,668	17,623	35,166	43,940	64,437	1,350,729	2,267*	7,223	2,903	7,200*	17,601	4,106	1,392,029
1940																	
Jan.	26,229	54,148	7,698	839	833	1,858	2,256	5,722	5,238	104,821	185	1,191	147	600	1,550	389	108,883
Feb.	45,651	37,960	8,946	2,030	892	1,164	2,678	4,307	6,931	110,559	94	477	234	600	1,662	239	113,865
Mar.	47,885	41,619	5,305	1,070	871	1,050	3,526	3,111	3,551	107,988	178	548	343	600	1,482	346	111,485
Apr.	24,607	43,945	4,144	817	990	1,799	2,951	1,834	2,927	84,014	203	598	120	600	1,159	317	87,011
May	57,874	40,335	7,337	972	1,046	1,370	2,696	2,582	4,578	118,790	195	364	361	600	2,305	331	122,946
June	45,471	44,809	5,603	841	712	1,421	4,077	2,178	2,730	107,842	168	405	127	600	1,080	101	110,323
July	42,861	60,671	7,330	884	310	1,767	2,494	4,253	4,045	124,615	169	342	298	600	1,035	443	127,502
Aug.	45,872	46,631	8,139	994	75	1,593	2,640	4,545	7,337	117,776	285	308	328	600	1,233	327†	120,857
Sept.	58,892	44,032	9,985	1,258*	61	1,743	2,404	3,247	9,303	130,925	165	323	145	600	1,295	349	133,802
Oct.	52,767	50,139	8,127	1,332*	509	1,693	2,564	3,355	2,082	122,568	275	1,024	404	600	1,860	348	127,079
Nov.	36,045	37,117	5,623	1 331*	1,295	1,137	3,360	3,463	6,715	96,086	248	830	148	600	1,513	392†	99,817
Dec.	56,263	35,493	10,693	1,331*	2,074	1,028	3,520	5,343	9,000	124,745	102	813	248	600	1,427	524	128,411
1941																	
Jan.	37,804	58,593	7,858	.....	955	2,085	2,445	2,137	9,058	120,935	333	750*	200*	600	2,103	448†	125,369
Feb.	27,115	42,091	4,346	.....	1,022	1,686	2,922	4,137	1,995	85,314	200*	828	200*	600	1,814	282†	89,238
Mar.	56,651	53,233	6,074	.....	1,285	1,154	3,726	5,712	6,286	134,121	200*	958	200*	600	2,835	250*	139,164
Apr.	41,206	48,915	6,991	.....	1,164	2,175	3,118	4,271	3,000*	110,840	250*	750*	200*	600	2,009	250*	114,899
May	53,062	48,029	7,786	.....	1,019	1,237	3,849	1,841	3,500*	120,323	200*	750*	200*	600	1,080*	250*	123,403

*Estimated. †Guayule rubber imports into U.S.A. provisional until export figures from Mexico are received. Source: *Statistical Bulletin of the International Rubber Regulation Committee.*

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ALL CLASSIFIED ADVERTISING MUST BE PAID IN ADVANCE

GENERAL RATES
Light face type $1.00 per line (ten words)
Bold face type $1.25 per line (eight words)

SITUATIONS WANTED RATES
Light face type 40c per line (ten words)
Bold face type 55c per line (eight words)

SITUATIONS OPEN RATES
Light face type 75c per line (ten words)
Bold face type $1.00 per line (eight words)

Allow nine words for keyed address. *Replies forwarded without charge*

SITUATIONS WANTED

PRACTICAL RUBBER CHEMIST, 12 YEARS' EXPERIENCE COMpounding and processing for tires, mechanical and proofed goods, involving natural rubber and all synthetics. Also experienced with latex, airfoam sponge, and dipped goods. Ph.D. Have held supervisory positions. Location immaterial. Address Box No. 295, care of INDIA RUBBER WORLD.

CHEMIST. INTERESTED IN SALES OR LABORATORY OPENING with supplier to rubber industry. Experience in proofing, adhesives, and lacquers. Address Box No. 296, care of INDIA RUBBER WORLD.

PRODUCTION SUPERINTENDENT WITH FIFTEEN YEARS' EXperience in the manufacture of mechanical rubber goods. Graduate chemist. Demonstrated ability to organize, handle labor, and carry problems through to completion. Age 40. Salary $8,500. Address Box No. 300, care of INDIA RUBBER WORLD.

FACTORY EXECUTIVE—SUPERINTENDENT TIRES, tubes, molded press goods. Capable, energetic, resourceful, knows processing and engineering thoroughly. Opportunity more important than starting salary. Address Box No. 301, care of INDIA RUBBER WORLD.

RUBBER CHEMIST, THOROUGH PRODUCTION AND COMPOUNDing experience. Can conduct research. Excellent schooling. Now holding responsible position. Desires change. Address Box No. 302, care of INDIA RUBBER WORLD.

EXECUTIVE WELL VERSED IN THE MANUFACTURE OF ALL rubberized fabrics, also pyroxylin and lacquers. Available at once. Address Box No. 308, care of INDIA RUBBER WORLD.

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The Classified Ad. Columns of INDIA RUBBER WORLD bring prompt results at low cost.

SITUATIONS WANTED (Continued)

WANTED: TO ACT AS REPRESENTATIVE OF manufacturer specializing in Lathe-Cut, Molded, and Extruded Items in all or part Midwest territory, including Chicago, Ill. Commission basis, no drawing account. Address Box No. 303, care of INDIA RUBBER WORLD.

SITUATION OPEN

RUBBER CHEMIST AND PRODUCTION MAN EXPERIENCED IN production of latex goods, footwear, and mechanicals. Permanent position with long-established Canadian company. State all qualifications and apply to Box No. 298, care of INDIA RUBBER WORLD.

BUSINESS OPPORTUNITIES

RUBBER FACTORY FOR SALE. 2 MILLS, 60" CALENDER, TUBing machine, horizontal vulcanizer, numerous other machinery. Going business. Address Box No. 305, care of INDIA RUBBER WORLD.

CAN HANDLE MILLING, CALENDERING, CRUDE RUBBER or rubber compounds, for factories on defense work or otherwise. Factory Newark, N. J. Address Box No. 306, care of INDIA RUBBER WORLD.

$5,000 TO $10,000 AVAILABLE OR MORE FOR INVESTMENT with services in a going manufacturing business in need of operating capital. Address Box No. 307, care of INDIA RUBBER WORLD.

WILL RENT SPACE IN MEADE RUBBER CO. PLANT, STOUGHton, Mass. Will install or equip with machinery to suit tenant. L. ALBERT & SON, Trenton, N. J.

(Advertisements continued on page 93)

Classified Advertisements

Continued

MACHINERY AND SUPPLIES FOR SALE

FOR SALE: 2—84" Heavy Duty Mills, also 1—60", 1—50", 1—36"; 12—30"x40", 2—38"x78" Hydraulic Presses; Several Hydraulic Pumps; also Mills, Calenders, Tubers, etc. CONSOLIDATED PRODUCTS CO., INC., 13-16 Park Row, New York, N. Y.

FOR SALE: 2—Royle No. 1 Tubers; 1—Mikro No. 2-F Pulverizer; 5—Werner and Pfleiderer Mixers, from Lab. to 200 gal. BRILL EQUIPMENT CORPORATION, 183 VARICK STREET, NEW YORK CITY.

FOR SALE: 1—TWO-ROLL WATER-COOLED RUBBER MILL, 6" & 8" dia. x 9" face; 75-foot Link-Belt Conveyer, 36" wide; Hydraulic Presses, Pumps and Accumulators, Rubber Mills, Mixers, Grinders, Pulverizers, etc. Send for latest bulletins. We buy your surplus equipment. STEIN EQUIPMENT CORP., 426 BROOME ST., NEW YORK CITY.

FOR SALE: 8 Opening Hydraulic Press, 30"x52"x2" steel steam platens, 3" per opening. 2—14"x23" stroke rams, complete with swing joints, pneumatic lift tables, valves, piping, fittings, gauges; Defiance T-136 Four Plunger Vertical Hydraulic Pump with 15 HP AC motor; Berlin 32" Endless Belt Sander; Sheridan 34" Perfection Cutter; all in excellent condition; other equipment including Mills, Calenders, Drives, Tubers, Vulcanizers, Boilers, etc. We invite your inquiries and offerings. INDUSTRIAL EQUIPMENT COMPANY, 870 Broad Street, Newark, New Jersey.

MACHINERY AND SUPPLIES WANTED

WANTED: *USED* EQUIPMENT TO FURNISH NEW RUBBER laboratory, including mill, tensile and abrasion testers, analytical balance, hydraulic press, ovens, torsion balance, etc. Address Box No. 299, care of INDIA RUBBER WORLD.

WANTED FOR USER: 1—NO. 3 OR NO. 9 BANBURY MIXER; 3—Mills; 1—Calender; 5—Hydraulic Presses, with pumps and accumulators; 2—Tubers. No. dealers. Address Box No. 304, care of INDIA RUBBER WORLD.

Spain

Rubber manufacturers in Spain were able to operate to a limited extent during the first quarter of 1941 thanks to the arrival of about 300 tons of crude rubber and small amounts of scrap rubber. It is expected that a further 2,000 tons, ordered in April, will arrive shortly, permitting factories to continue production at almost normal rates for six months.

Dividends Declared

Company	Stock	Rate	Payable	Stock of Record
Acme Wire Co.	Com.	$0.50	Aug. 15	July 31
Anaconda Wire & Cable Co.	Com.	$0.50	July 21	July 11
Armstrong Cork Co.	Com.	$0.50 int'm	Aug. 1	July 8
Armstrong Cork Co.	Com.	$0.25 int'm	Sept. 1	Aug. 4
Armstrong Cork Co.	Pfd.	$1.00 q.	Sept. 15	Sept. 1
Baldwin Rubber Co.	Com.	$0.125	July 21	July 15
Boston Woven Hose & Rubber Co.	Com.	$2.50 extra	Aug. 25	Aug. 15
Boston Woven Hose & Rubber Co.	Com.	$0.50	Aug. 25	Aug. 15
Canada Wire & Cable Co., Ltd.	"A"	$1.00 q.	Sept. 15	Aug. 31
Canada Wire & Cable Co., Ltd.	"B"	$0.50 int'm	Sept. 15	Aug. 31
Canada Wire & Cable Co., Ltd.	6½% Pfd.	$1.625 q.	Sept. 15	Aug. 31
Collyer Insulated Wire Co.	Com.	$0.30	July 1	June 24
Crown Cork & Seal Co., Inc.	Com.	$0.25	Aug. 12	July 28
Dayton Rubber Mfg. Co.	Com.	$0.25	July 30	July 15
Dayton Rubber Mfg. Co.	"A"	$0.50	July 30	July 15
Detroit Gasket & Mfg. Co.	Pfd.	$0.30 q.	Sept. 2	Aug. 15
DeVilbiss Co.	Com.	$0.50	July 15	June 30
DeVilbiss Co.	Pfd.	$0.175 q.	July 15	June 30
Dewey & Almy Chemical Co.	Com.	$0.35	Sept. 15	Aug. 29
Dewey & Almy Chemical Co.	"B"	$0.35	Sept. 15	Aug. 29
Dewey & Almy Chemical Co.	$5 Cum. Cv. Pfd.	$1.25 q.	Sept. 15	Aug. 29
Electric Storage Battery Co.	Com.	$0.50	Sept. 30	Sept. 9
General Cable Corp.	Pfd.	$1.75	Aug. 1	July 25
General Electric Co., Ltd.	7½%	extra	.....	.....
General Electric Co., Ltd.	10%	final	.....	.....
B. F. Goodrich Co.	Com.	$0.50	Aug. 1	July 25
B. F. Goodrich Co.	$5 Pfd.	$1.25 q.	Sept. 30	Sept. 23
Goodyear Tire & Rubber Co., Inc	Com.	$0.25 q.	Sept. 15	Aug. 16
Goodyear Tire & Rubber Co., Inc.	$5 Cum. Cv. Pfd.	$1.25 q.	Sept. 15	Aug. 15
Lee Rubber & Tire Corp.	Com.	$0.75	Aug. 1	July 25
Midwest Rubber Reclaiming Co.	Com.	$0.50 q.	Aug. 1	July 21
Midwest Rubber Reclaiming Co.	Pfd.	$1.00 q.	Sept. 2	Aug. 20
Ohio Rubber Co.	Com.	$5.00 irreg.	June 23	June 20
Okonite Co.	Com.	$0.50 extra	Aug. 1	July 22
Okonite Co.	Com.	$1.50	Aug. 1	July 22
Okonite Co.	Pfd.	$1.50 q.	Sept. 2	Aug. 14
Pahang Rubber	Com.	$0.10	June 30	June 21
Phelps Dodge Corp.	Com.	$0.50 incr.	Sept. 10	Aug. 15
Philadelphia Insulated Wire Co.	Com.	$0.25 incr. s.	Aug. 15	Aug. 1
Plymouth Rubber Co.	7% Pfd.	$1.75 q.	July 15	July 1
Raybestos-Manhattan, Inc.	Com.	$0.375 q.	Sept. 15	Aug. 29
U. S. Rubber Reclaiming Co. Inc.	Pt. Pfd.	$0.50	July 15	July 11
S. S. White Dental Mfg. Co.	Com.	$0.30 incr.	Aug. 16	Aug. 1

WANTED: Names of manufacturers of lead rubber sheathing for X-ray protection.

See page 97

United States Statistics

Imports for Consumption of Crude and Manufactured Rubber

	April, 1941 Quantity	April, 1941 Value	Four Months Ended April, 1941 Quantity	Four Months Ended April, 1941 Value
UNMANUFACTURED—*Free*				
Liquid latex (solids) *lb.*	3,570,742	$648,217	18,885,115	$3,721,831
Jelutong or pontianak *lb.*	1,152,276	189,520	6,027,046	915,677
Balata *lb.*	142,640	18,533	440,940	90,380
Gutta percha *lb.*	327,903	51,323	1,618,397	274,326
Guayule *lb.*	948,300	95,916	3,536,900	364,173
Scrap and reclaimed *lb.*	1,259,334	32,590	3,985,621	92,888
Crepe soled rubber *lb.*	44,025	9,450	186,931	41,205
Totals	7,445,220	$1,045,549	34,680,950	$5,500,480
Misc. rubber (above), 1,000 *lbs.*	7,445	$1,045,549	34,681	$5,500,480
Crude rubber 1,000 *lbs.*	137,284	24,193,639	674,743	120,064,720
Totals 1,000 *lbs.*	144,729	$25,239,188	709,424	$125,565,200
Chicle, crude *lb.*	909,690	$332,319	8,033,890	$3,041,598
MANUFACTURED—*Dutiable*				
Rubber tires *no.*	552	$4,800	3,092	$64,495
Rubber boots, shoes and overshoes *prs.*	5,520	2,239	15,565	5,254
Rubber soled footwear with fabric uppers *prs.*	69,042	10,913	407,075	76,168
Golf balls *no.*	61,680	6,770	157,248	17,833
Lawn tennis balls *no.*	69,840	9,165	158,184	19,225
Other rubber balls *no.*	137,076	4,917	1,159,277	23,672
Other rubber toys	.....	1,816	.....	6,520
Hard rubber combs *no.*	.....	.....	.....	.....
Other manufactures of hard rubber	.....	40	.....	47
Friction or insulating tape *lb.*	3,411	3,262	8,828	6,053
Belts, hose, packing, and insulating material	.....	17,152	.....	26,724
Druggists' sundries of soft rubber	.....	421	.....	1,612
Inflatable swimming belts, floats, etc. *no.*	86,144	7,107	206,666	19,221
Other rubber and gutta percha manufactures	.....	19,467	.....	49,747
Totals	.....	$88,069	.....	$316,571

Exports of Foreign Merchandise

RUBBER AND MANUFACTURES				
Crude rubber *lb.*	524,173	$99,371	2,646,224	$544,894
Balata *lb.*	31,800	12,217	114,497	46,622
Other rubber, rubber substitutes and scrap *lb.*	640	114	13,806	3,848
Rubber manufactures (including toys)	.....	31,928	.....	77,752
Totals	.....	$143,630	.....	$673,116

Exports of Domestic Merchandise

RUBBER AND MANUFACTURES				
Reclaimed *lb.*	2,578,669	$137,142	8,421,504	$447,946
Scrap *lb.*	4,396,983	74,298	27,656,052	424,868
Cements *gal.*	28,395	23,749	119,576	118,902
Rubberized auto cloth *sq. yd.*	38,641	14,996	118,447	52,966
Other rubberized piece goods and hospital sheetings *sq. yd.*	245,307	117,932	1,217,663	644,381
Boots *prs.*	5,799	13,253	36,181	86,903
Shoes *prs.*	16,531	13,414	82,813	53,867
Canvas shoes with rubber soles *prs.*	61,972	52,350	250,646	197,721
Soles *doz. prs.*	24,689	16,622	32,983	38,899
Heels *doz. prs.*	41,328	22,936	120,671	65,550
Soling and top lift sheets *lb.*	34,362	7,832	138,052	30,480
Gloves and mittens *doz. prs.*	7,434	15,701	36,404	76,746
Water bottles and fountain syringes *no.*	58,959	20,762	171,070	57,152
Other druggists' sundries	.....	94,252	.....	352,747
Gum rubber clothing *doz.*	11,802	43,057	55,906	162,304
Balloons *gross*	12,873	13,713	67,002	54,232
Toys and balls	.....	8,275	.....	33,370
Bathing caps *doz.*	3,464	6,133	15,271	28,723
Bands *lb.*	17,734	8,205	50,408	23,220
Erasers *lb.*	17,184	10,380	84,679	48,836
Hard rubber goods				
Electrical battery boxes *no.*	34,848	31,298	125,447	101,009
Other electrical *lb.*	28,998	12,638	181,564	56,284
Combs, finished *doz.*	35,789	19,205	95,093	51,853
Other hard rubber goods	.....	18,402	.....	92,745
Tires				
Truck and bus casings *no.*	67,867	1,640,861	272,396	6,244,909
Other auto casings *no.*	89,310	871,088	268,061	3,354,591
Tubes, auto *no.*	113,632	232,602	409,219	943,397
Other casings and tubes *no.*	37,602	643,383	97,954	1,087,323
Solid tires for automobiles and motor trucks *no.*	153	4,503	1,547	40,288
Other solid tires *lb.*	90,869	14,159	128,805	25,343
Tire sundries and repair materials *lb.*	254,835	75,067	980,653	281,155
Rubber and friction tape *lb.*	63,284	19,264	247,765	72,401
Fan belts for automobiles *lb.*	51,791	23,544	152,639	74,067
Other rubber and balata belts *lb.*	255,094	131,497	1,134,108	624,593
Garden hose *lb.*	34,668	6,175	157,595	31,307
Other hose and tubing *lb.*	513,287	215,596	2,264,432	1,013,502
Packing *lb.*	168,218	68,553	536,315	237,380
Mats, matting, flooring, and tiling *lb.*	139,323	21,133	508,493	70,206
Thread *lb.*	20,048	23,846	127,695	115,908
Gutta percha manufactures *lb.*	48,109	14,209	207,348	72,509
Latex (d.r.c.) and rubber sheets processed for further manufacture *lb.*	342,872	75,032	643,848	134,874
Synthetic rubber (bulk) *lb.*	177,520	88,577	487,025	256,752
Other rubber manufactures	.....	157,294	.....	656,825
Totals	.....	$5,122,928	.....	$18,639,034

Dominion of Canada Statistics

Imports of Crude and Manufactured Rubber

	May, 1941 Quantity	May, 1941 Value	Five Months Ended May, 1941 Quantity	Five Months Ended May, 1941 Value
UNMANUFACTURED				
Crude rubber, etc. *lb.*	12,192,392	$2,501,545	47,676,709	$9,920,717
Latex (dry weight) *lb.*	343,290	105,534	1,752,100	535,352
Gutta percha *lb.*	635	127	8,942	5,547
Rubber, recovered *lb.*	1,815,600	99,065	6,859,400	382,213
Rubber, powdered, and gutta percha scrap *lb.*	493,600	7,806	2,184,600	43,084
Balata *lb.*	6,439	1,702	19,379	4,816
Rubber substitute *lb.*	59,500	18,815	230,500	67,534
Totals	14,911,456	$2,734,594	58,731,630	$10,959,263
PARTLY MANUFACTURED				
Hard rubber comb blanks	.....	$4,160	.....	$24,585
Hard rubber, n. o. s. *lb.*	4,778	5,924	21,028	19,719
Rubber thread not covered *lb.*	9,105	12,386	20,339	21,802
Totals	13,883	$22,470	41,367	$66,106
MANUFACTURED				
Bathing shoes *prs.*	9,427	$1,804	31,173	$6,353
Belting	.....	11,884	.....	77,933
Hose	.....	26,842	.....	143,960
Packing	.....	9,748	.....	41,407
Boots and shoes *prs.*	325	946	4,350	6,349
Canvas shoes with rubber soles *prs.*	2,602	1,006	9,775	4,004
Clothing, including waterproofed	.....	4,023	.....	17,896
Raincoats *no.*	6,944	24,875	24,225	80,701
Gloves *doz. prs.*	4	155	612	1,983
Hot water bottles	.....	.....	.....	954
Liquid sealing compound	.....	6,302	.....	20,030
Tires, bicycle *no.*	2,709	2,234	11,053	9,056
Pneumatic *no.*	4,130	117,888	17,045	452,826
Solid for automobiles and motor trucks *no.*	24	926	153	6,622
Other solid tires	.....	3,418	.....	9,420
Inner tubes *no.*	2,882	10,167	13,041	45,230
Bicycle *no.*	4,163	903	12,228	3,227
Mats and matting	.....	7,294	.....	55,682
Cement	.....	11,327	.....	57,197
Golf balls *doz. prs.*	3,826	6,227	11,015	20,211
Heels *prs.*	8,394	444	46,287	3,479
Other rubber manufactures	.....	207,973	.....	1,108,303
Totals	.....	$456,386	.....	$2,172,823
Totals, rubber imports	.....	$3,213,450	.....	$13,198,192

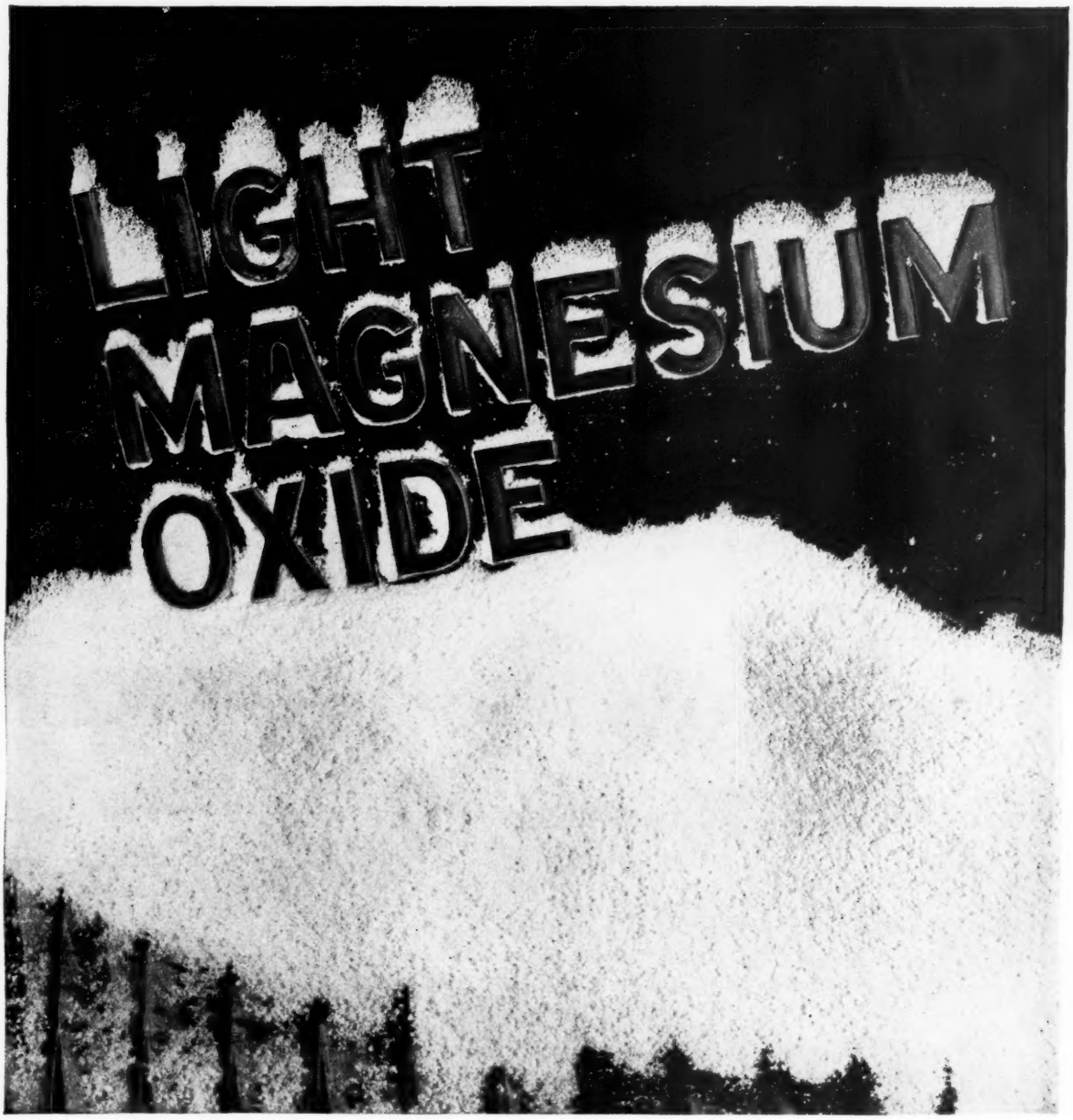
Exports of Domestic and Foreign Rubber Goods

	Produce of Canada Value	Reexports of Foreign Goods Value	Produce of Canada Value	Reexports of Foreign Goods Value
UNMANUFACTURED				
Crude rubber	.....	.....	$73	.....
Waste rubber	$26,242	.....	99,417	.....
MANUFACTURED				
Belting	$53,252	.....	$186,586	.....
Bathing caps	274	.....	696	.....
Canvas shoes with rubber soles	62,835	.....	154,995	.....
Boots and shoes	107,991	.....	596,762	.....
Clothing, including waterproofed	25,626	.....	99,226	.....
Heels	2,366	.....	7,111	.....
Hose	540,849	.....	1,231,655	.....
Soles	1,217	.....	4,477	.....
Soling slabs	990	.....	3,795	.....
Tires, pneumatic	409,616	.....	1,822,434	.....
Not otherwise provided for	169,522	.....	520,834	.....
Inner tubes	47,147	.....	212,502	.....
Other rubber manufactures	75,431	.....	186,648	.....
Totals	$1,497,116	.....	$5,027,721	.....
Totals rubber exports	$1,523,358	.....	$5,127,211	.....

Infra-Red Equipment

(*Continued from page* 43)

A detailed description of a tunnel, oven, or other unit designed for any one of these suggested jobs for any given plant would not, except by pure chance, be of optimum arrangement for even the same job in any other plant and would, therefore, be more harmful than useful. Suffice it, then, to say that industrial use of infra-red is so new that the full scope of application has not yet been determined. However any rubber manufacturer who has a place for a compact, clean, flexible, highly adaptable heat source that can be either spread over a broad field, concentrated in a restricted location, or reflected round corners, or into cavities, would do well to investigate thoroughly the possibilities of infra-red.



WITCO Extra Light Calcined Magnesium Oxide assures many advantages in the compounding of synthetic rubber-like materials. Another grade of Witco Magnesia—Heavy Calcined—is an excellent accelerator in hard or semi-hard rubber. It is often used in mechanical rubber goods, where it both accelerates the cure and prevents sulphur bloom. Wishnick-Tumpeer will gladly assist users in the selection and application of the proper Magnesia for their particular needs.

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"AMERICA'S FIRST"

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Call, Wire or Write IWS for Inspection or Repair of Your Banbury Mixers

At no time was the saying, "a stitch in time saves nine," more applicable than now, when equipment must be at peak efficiency to satisfy unusual demands.

Competent inspection *in time* would have caught the trouble illustrated above before the rotors broke, and consequently would have reduced resultant expense and time lost.

A telephone call, wire or letter to us will bring competent inspectors to your plant. They'll quickly spot potential trouble in your Banburys. We offer this friendly service.

In Banbury rebuilding and repairing, factory managers and production men the country over recommend our service. We restore every part from rotors to gears to original dimensions and efficiency, and our hard surfacing treatment resists wear. The broken rotors shown above, together with all other parts of the Banburys, were repaired and rushed back to their owners . . . with original performance and efficiency guaranteed.

For Banbury inspection, repair, or reconditioning call or write us.

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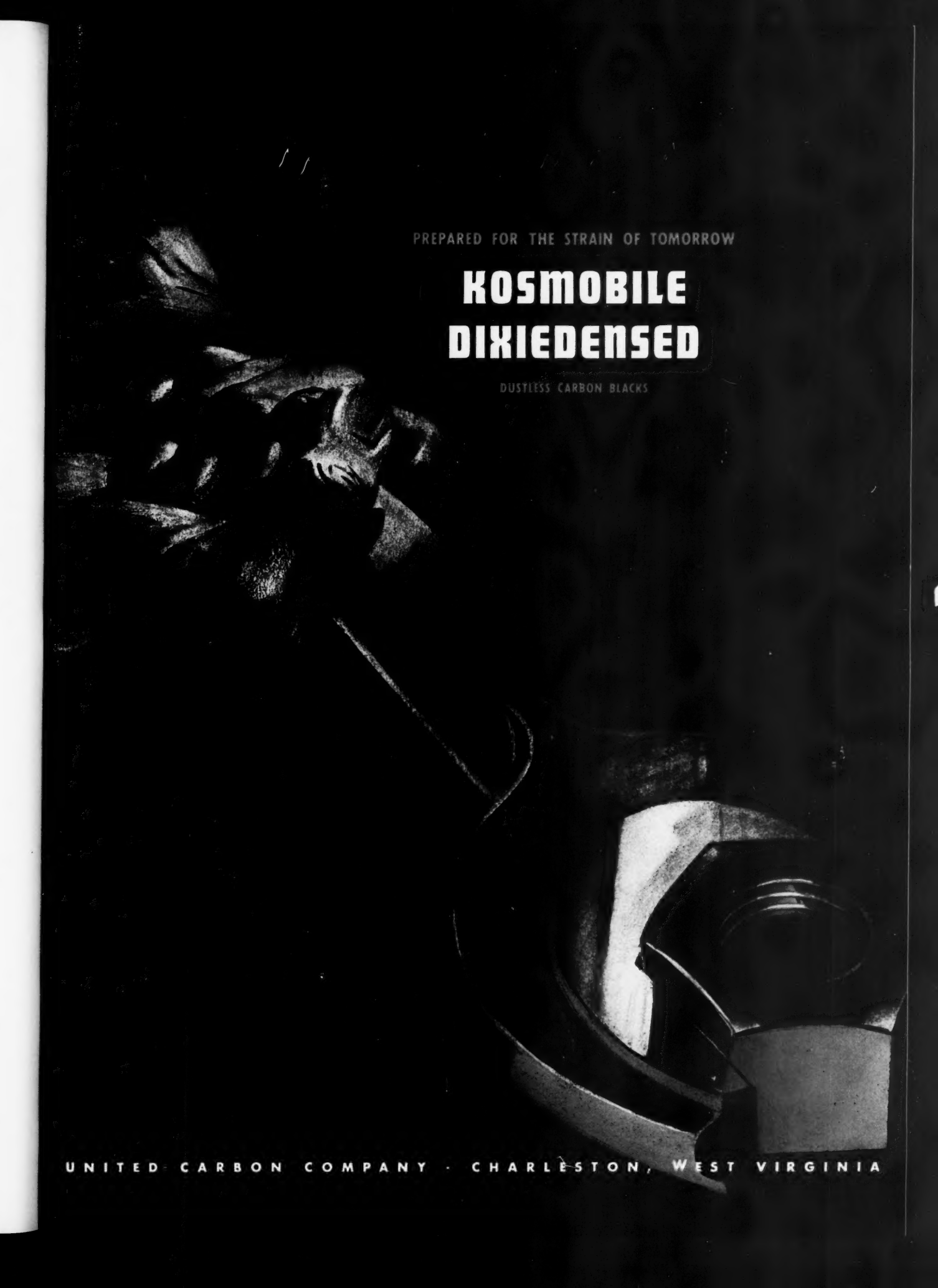
PREPARED FOR THE STRAIN OF TOMORROW
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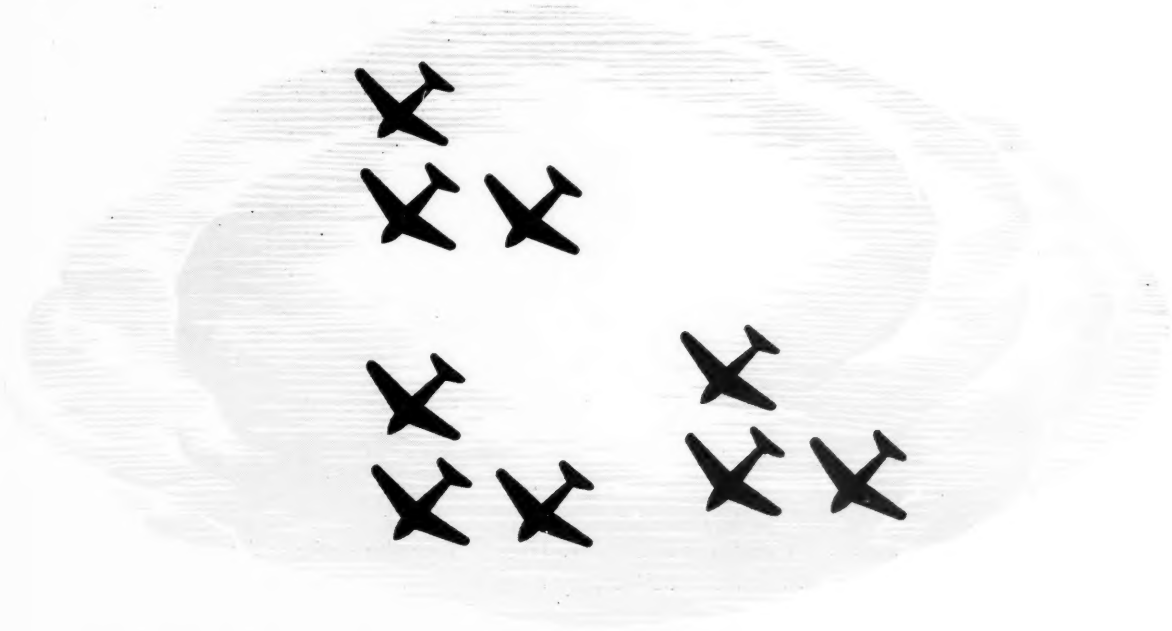
KOSMOBILE AND DIXIEDENSED STAND FOR THE HIGHEST DEVELOPMENT IN BLACKS FOR RUBBER COMPOUNDING. THEY ASSURE PRODUCTS THAT ARE WELL PREPARED FOR THE STRAIN OF TOMORROW.



WHEN TEAMWORK COUNTS

It is in abnormal times like these, when abnormal demands are made on raw materials, that we feel most deeply our responsibility to our customers who have made possible the phenomenal growth of this company during the past 13 years. Although our production facilities are today taxed to the utmost we are maintaining our plants at the highest possible efficiency and we expect *with your continued cooperation* to be able to supply your requirements for GASTEX and PELLETEX.

We know that, under the circumstances, we can count on your patience in case unavoidable delays in deliveries are encountered. If restrictions on the use of rubber are necessitating changes in your compounds, we shall be glad to work with you in developing satisfactory formulations. Thank you!

Earl J. Wright
General Manager

GENERAL ATLAS CARBON DIVISION

OF GENERAL PROPERTIES COMPANY, INC.

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Plants: Pampa, Tex.; Guymon, Okla.

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CONTINENTAL A:
Fast Cure, Easy Processing

CONTINENTAL B:
Fast Cure, Medium Processing

CONTINENTAL C:
Medium Cure, Easy Processing

CONTINENTAL D:
Medium Cure, Medium Processing

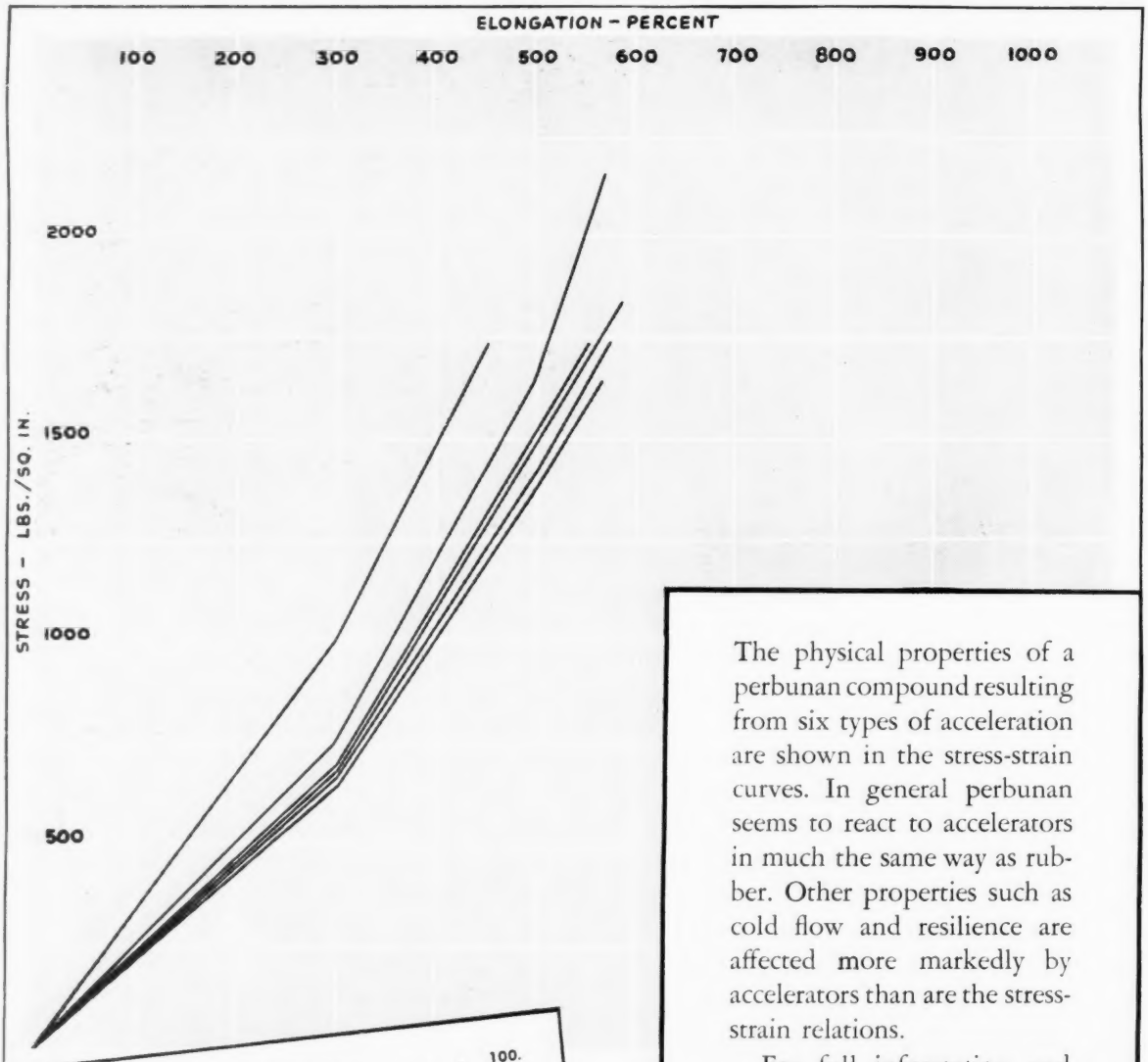
CONTINENTAL E:
Medium Cure, Hard Processing

CONTINENTAL F:
Slow Cure, Medium Processing

CONTINENTAL G:
Slow Cure, Hard Processing

Continental

Accelerators for Perbunan



BASE FORMULA

PERBUNAN	100.
SULFUR	1.5
ZINC OXIDE	5.
STEARIC ACID	1.
DIBUTYL PHTHALATE	20.
FLECTOL H	2.
SOFT BLACK	50.

	A	B	C	D	E	F
SANTOCURE	—	—	.30	.375	.75	—
EL SIXTY	.75	1.	.45	—	—	—
D P G	.20	—	—	.375	—	.18
THIURAD	—	—	—	—	—	—
HARDNESS	53	52	52	53	53	54

The physical properties of a perbunan compound resulting from six types of acceleration are shown in the stress-strain curves. In general perbunan seems to react to accelerators in much the same way as rubber. Other properties such as cold flow and resilience are affected more markedly by accelerators than are the stress-strain relations.

For full information and technical service, inquire: MONSANTO CHEMICAL COMPANY, Rubber Service Dept., Akron, Ohio.

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